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To cite this article: M. M. Kuyvenhoven, C. Spreeuwenberg & F. W. M. M. Touw-Otten (1989) Diagnostic Styles of General Practitioners Confronted with Ambiguous Symptoms: *An Exploratory Study*, *Scandinavian Journal of Primary Health Care*, 7:1, 43-48, DOI: [10.3109/02813438909103670](https://doi.org/10.3109/02813438909103670)

To link to this article: <https://doi.org/10.3109/02813438909103670>



Published online: 12 Jul 2009.



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Diagnostic Styles of General Practitioners Confronted with Ambiguous Symptoms

An Exploratory Study

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M. M. Kuyvenhoven, C. Spreeuwenberg and F. W. M. M. Touw-Otten. Diagnostic styles of general practitioners confronted with ambiguous symptoms. An exploratory study. *Scand J Prim Health Care* 1989; 7: 43-8.

This study explores the diagnostic process of general practitioners confronted with ill-defined and ambiguous complaints, which eventually appeared to be caused by a malignancy. Three aspects were rated: (a) the adequacy of the initial problem definition; (b) the carefulness of further diagnostic methods; and (c) how the suspicion of malignancy originated. These three aspects, which were strongly connected, seem to be parts of a diagnostic approach with two polar extremes: a *critical style* and a *biased style*. Characteristic of a critical style is full awareness of detail, careful observations, consideration of ambiguous symptoms, and consciousness that the correct diagnosis is often other than the one initially judged most likely. The opposite, the biased style, is characterized by little alertness for detail, less careful observations, and overinterpretation of facts supporting the initial hypotheses.

Key words: general practitioners, ambiguous complaints, bronchial carcinoma, diagnostic styles.

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Since the symptoms and signs at an early stage of a disease are still vague, it is often impossible in general practice to relate them satisfactorily to a nosological diagnosis at the first contact. An efficient and effective diagnostic procedure requires a precise follow-up of the progress of these symptoms and an adequate assessment of the clinical signs. At a first contact it would be better to make the assessment in the form of a problem definition rather than in terms of a nosological system. Ideally a problem definition should contain physical as well as non-physical components(1, 2).

Diagnostic mistakes are often related to the psychological mechanisms underlying the diagnostic process. Several studies indicate that physicians generate two to six hypotheses within the earliest minutes of an encounter (3, 4). Very frequently these hypotheses are generated by association (3, 5)

and are then tested by collection of further clinical information. Hypotheses once yielded are seldom rejected, even when the clinical facts do not fit the hypotheses (6, 7). As for all human beings, it is easier for a doctor to fit gathered data to an already hypothesized diagnosis than to try to refute such a diagnosis.

This study explores the diagnostic process of general practitioners (GPs) confronted with patients ill-defined and ambiguous complaints, which eventually appeared to be caused by bronchial carcinoma. With such complaints the GP has to choose between the option of avoiding unnecessary investigations and referral and that of diagnosing a serious disease such as a malignancy as early as possible (8, 9).

A diagnostic problem of bronchial carcinoma is that its symptomatology in the early phases is often not specific, so that the problem definition may con-

tain a wide range of differential diagnoses of varying probability, and patient or doctor delay may occur.

There are usually several doctor-patient contacts before the correct diagnosis can be established.

This study examines three points:

1. To what extent does the problem definition correspond with the available clinical facts during the first doctor-patient encounter?
2. How carefully are the clinical facts assessed in the diagnostic process?
3. How does the suspicion of malignancy originate?

METHODS

To find a provisional answer we decided to review a report of a study-group of 11 GPs who systematically discussed 20 cases of patients in whom bronchial carcinoma was diagnosed or suspected. These discussions were led by a senior staff member.

Ten cases were excluded from the analysis because the GP was not involved in the diagnostic process or because the patient's condition was already so bad that malignancy could be diagnosed by a layman at first sight. Three aspects of the diagnostic process were rated:

(a) *The adequacy of the problem definition after the first encounter*

Two aspects were judged: (1) whether the problem definition was reasonable and appropriate to the clinical facts, which were at the disposal of the GP at that time, and (2) whether the certainty of the differential diagnosis corresponded with the clinical facts, e.g.:

Case 2: male, 78 years old, no past history, consults because of influenza-like symptoms and green sputum. Findings: 38.3°C; dull percussion sounds right base and diminished breath sounds right.

Problem definition: "early pneumonia, meaning unclear and possibly caused by another condition".

Problem definition has been judged as adequate, because it fits the clinical facts and leaves possible diagnostic alternatives.

Case 8: a rarely consulting 66-year-old male patient complaining of hoarseness, coughing, and purulent sputum. At examination: breath sounds diminished and hyperinflated chest.

Problem definition: "a clear case of emphysema".

This problem definition is judged as inadequate, because emphysema is not an appropriate diagnosis for these symptoms and signs.

(b) *The carefulness of further diagnostic methods*

This relates to the further diagnostic activities and the way in which new and often ambiguous information is handled. Here it is crucial as to how the GP pays attention to ambiguous information, choosing an approach that enables him to test his hypothesis. Disregarding hoarseness or failure to follow up elderly patients with suspected lung infections after antibiotics are judged as poor care. By contrast, it is good care when the GP, unable to interpret the complaints, asks the patient to return, or consults a colleague.

(c) *How does the suspicion of malignancy originate?*

It was investigated whether the malignancy had been suspected because of an obviously poor condition of the patient, or whether the suspicion resulted from the professional activities of the GP. When a GP refers a patient with pneumonia to a specialist, seeking underlying causes such as pulmonary emboli or an obstruction-pneumonia, the suspicion of malignancy results from the professional activities of the GP.

Independent ratings made by a GP and a medical sociologist were in complete accordance. A third judge (a medical sociologist) rated four cases as a check, and gave the same ratings.

RESULTS

The study concerned the diagnostic process relating to ten patients. One patient was 37 years old, while the others ranged from 50 to 78 years. In half the cases an adequate problem definition was formulated *after the first consultation* (Table I). Problem definition was inadequate in the remaining five cases (Table II).

The adequacy of problem definition was not related to the patient's symptoms and signs. The five GPs who made an adequate problem definition and those who did not were confronted with equally ill-defined and ambiguous symptoms. The latter disregarded and did not admit these symptoms in their problem definition.

In the *further diagnostic process* four of the five

Table I. The clinical facts after the first consultation, further procedures, and how the suspicion of malignancy arose in the five cases, in which an adequate problem definition was formulated.

(1) Male, 64, complex medical history, gastric complaints, venous thrombosis in both legs after an operation and arthro-sis of the hip	(2) Male, 78, no past history	(3) Male, 51, since one year on the list, severe headaches	(4) Male, 67, regular laboratory test of prothrombin time to control the dosage of coumarin	(5) Male, 65, smoker, no past history
<i>After the first consultation</i>				
<i>Clinical facts</i>				
<ul style="list-style-type: none"> - impression of serious illness, temperature 39°C - painful breathing - no signs of embolism (lungs and legs) - diminished breath sounds left normal percussion - brothers died due to bronchial carcinoma 	<ul style="list-style-type: none"> - some symptoms of influenza - green coloured sputum - dull percussion sound right base - diminished breath sounds right 	<ul style="list-style-type: none"> - severe headache - recent psychiatric diagnosis: reactive depression 	<ul style="list-style-type: none"> - haemoptysis for the second time (first time no visit to the GP) 	<ul style="list-style-type: none"> - precordial and substernal tightness - increasing dyspnoea - no tiredness, no fever or other symptoms - no physical signs
<i>Diagnosis</i>				
Pulmonary embolism or pneumonia with pleuritis (treatment: antibiotic and aspirin)	Beginning of a bronchopneumonia or something else	Homonymous hemianopia due to cerebral tumour?	Haemoptysis and use of coumarin	"suspect"
<i>Further procedures</i>				
<ul style="list-style-type: none"> - observe the legs - ESR - home visit next day: temperature decreased, still crusty sputum - after 2 days home visit together with an assistant (again fever) - read just the hypothesis: "obstruction pneumonia due to bronchial carcinoma or pulmonary embolism" 	<ul style="list-style-type: none"> - home visit every third day - referral to a consultant for a chest X-ray. Conclusion: broncho pneumonia, no signs of serious cause - after 3 months: patient recovered well - after 4 months: same clinical picture, again antibiotics 	<ul style="list-style-type: none"> - GP did not understand the symptoms and asked the patient to return - GP searched for further information (by study in books and patient's medical history and by consultation of a colleague) - GP repeated the neurological examination - GP doubted the psychiatric diagnosis 	<ul style="list-style-type: none"> - GP contacted the coumarin dosage service to pay attention to the haemoptysis; the service changed the dosage without further investigation of the cause of bleeding - GP asked for the prothrombin time: normal - GP concluded that bleeding must have another cause 	<ul style="list-style-type: none"> - GP decided to make an X-ray of the thorax, although the patient did not want it
<i>The way the suspicion of a bronchial carcinoma arose</i>				
Referral to an internist checking the hypothesis. Scan and echoscopia confirmed the hypothesis	Referral to a chest physician: post-stenotic infiltration in the right top of the lung	Referral to a neurologist: cerebral tumour? (confirmed as a metastatic process of a bronchial carcinoma)	Chest X-ray; bronchial carcinoma	Chest X-ray; bronchial carcinoma

Table II. *The clinical facts after the first consultation, further procedures, and how the suspicion of malignancy arose in the five cases, in which an inadequate problem definition was formulated.*

(6) Male, 65, no past history	(7) Male, 37, no past history	(8) Male, 66, rare visits to the GP	(9) Male, 66, disabled, peri-arthritis of the shoulder, alcohol addiction	(10) Male, 76, complex medical history with bronchiectasia, periodic visits to a chest physician
<i>After the first consultation</i>				
<i>Clinical facts</i>				
<ul style="list-style-type: none"> - myalgia right side of the thorax, right shoulder and right lumbar region - looks ill - cough - hypertension - diminished movement of the lungs (especially right) - no dull percussion noted - ESR (elevated) 	<ul style="list-style-type: none"> - after tonsillectomy persistent cough, tiredness and sore throat - ESR 44 mm/l hour - no abnormalities in blood count, number and differentiation of leucocytes 	<ul style="list-style-type: none"> - hoarseness, cough - purulent sputum - on examination: breath sounds diminished and hyperinflated chest 	<ul style="list-style-type: none"> - headache - hypertension (105 mmHg diastolic) 	<ul style="list-style-type: none"> - after pneumonia the patient complains about pain behind the right nipple; patient was afraid of a carcinoma of the chest
<i>Diagnosis</i>				
Myalgia with doubt about the cause	"No mononucleosis infectiosa"	"A clear case of emphysema"	Myalgia	No problem
<i>Further procedures</i>				
<ul style="list-style-type: none"> - GP ignored persistent cough; diminished lung function and looking ill - GP prescribed antibiotics and codein - GP made no further appointment - GP arranged nothing to deal with laboratory results 	<ul style="list-style-type: none"> - no attention to cough, loss of weight, tiredness and persistence of high ESR - when Paul Bunnell test remained negative the GP reassured the patient and did not do anything further 	<ul style="list-style-type: none"> - GP gave antibiotics and did not make a new appointment - GP did not pay attention to a deputy's message that the patient brought up some blood - GP considered aggravation of patient's situation as confirmation of his diagnosis emphysema 	<ul style="list-style-type: none"> - GP ignored symptoms and signs (a tumour of the skull, cough, etc.) - GP consulted a colleague but took no further action 	<ul style="list-style-type: none"> - reassurance of the patient - when the patient told the GP about haemoptysis, the GP ignored this information
<i>The way the suspicion of a bronchial carcinoma arose</i>				
Pressure by wife and children to refer; patient obviously deteriorating. A chest X-ray	One and a half years later the patient was visited by a deputy. The deputy referred patient to a consultant	Second haemoptysis in the fifth period of illness, 10 months after first visit	Deterioration of patient's situation (refusal of food, etc.) X-ray of the thorax and cervical vertebrae	A consultant, after referral for suspicion of a gastric carcinoma by a deputy

GPs with an inadequate problem definition did not consider ambiguous clinical data at their disposal in their diagnostic activities (Table II). They did not react to these data and overinterpreted facts corre-

sponding with their initial hypothesis. In the fifth case (case 9) there was a similar pattern, because information of a deputy was not carefully considered. The GPs with an adequate problem definition

were fully open to ambiguous data and integrated them into their diagnostic activities by asking the patient to return, by causing a colleague, or by doing laboratory investigations.

The way in which *suspicion of malignancy* eventually arose varied. In the case of the five GPs whose initial problem definition was adequate, suspicion resulted from their diagnostic activities (Table I). The other five GPs began to suspect malignancies after obvious deterioration of the patient, pressure from the family, or as a result of casual diagnosis by a deputy or a partner in a group practice (Table II).

DISCUSSION

This study shows that GPs confronted with ill-defined and ambiguous and non-specific signs and symptoms have differing diagnostic styles.

The results demonstrate a strong connection between the adequacy of the initial problem definition and the way in which clinical facts are integrated into the diagnostic activities. These two elements of the diagnostic process are possibly based on a specific diagnostic approach of the GP confronted with ill-defined and ambiguous, non-specific signs and symptoms. This approach has two polar extremes: *the critical style* and *the biased style*.

Characteristic of a critical style is full awareness of detail, careful observation, consideration of ambiguous signs and consciousness that the correct diagnosis may be other than the one initially judged most likely. For that purpose it is important to formulate predictions about the anticipated outcome, which can be tested (2, 10).

The opposite style is characterized by little alertness for detail, less careful observation, ignoring facts that do not fit with the initial interpretation of the complaints, and overinterpretation of facts supporting the initial hypothesis. Since predictions about the anticipated outcome are not made, it is relatively difficult to reject initial hypothesis. This non-critical and hazardous style is called *biased style*. Biased style refers to the tendency to retain early hypotheses in spite of subsequent information.

The way in which the suspicion of malignancy arises is connected to the diagnostic style. This underlines the importance of being fully awake to all the complaints of patients with ambiguous signs, which are not specific to certain diseases.

We present the findings with caution because the study is retrospective and exploratory. Further test-

ing in a prospective design is necessary, and it may be fruitful to study whether GPs also have these two diagnostic styles when confronted with other complaints. However, our results correspond with the findings and ideas of other authors (10, 11).

The diagnostic style is not the only cause of mistakes in diagnosis. These can also be traced back to a lack of epidemiological knowledge, false estimates of probability, and insufficient knowledge concerning prospective values of positive and negative test results (2, 12). Our findings underline the importance of an extended training in problem-solving activities inside and outside hospital. There is also a need for studies that give information for the GP about the predictive value of symptoms of cancer (13).

ACKNOWLEDGEMENTS

We thank the eleven general practitioners who participated in the discussion of cases: J. Nooter †, A. M. van Dongen, K. Gill, L. R. Kooij, F. E. M. Ooms, G. C. A. Essens, P. Sluis, H. J. W. Brinkman, P. K. van der Ent Braat, M. Knoppers and M. Sanders.

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Received May 1988

Accepted October 1988