In conclusion we reiterate some of the main clinical features of epiglottitis. (1) In general the patients are children aged 2-7 years. (2) There is rapid progression from the first mild respiratory symptoms to severe illness, with pronounced dysphagia and drooling, stridor, muffling of the voice, bull neck (in some cases), and such deterioration of the general condition that the terms "shock," "prostration," and "collapse" have been used by various authors. (3) There is no time to spare, and the giving of parenteral antibiotics, admission to hospital, and the establishment of an artificial airway are urgently needed life-saving measures.

ADDENDUM

Three more children with haemophilus epiglottitis were admitted to the Infirmary in July and September 1971. Their ages were 3, 2, and 1½ years. Two were treated successfully. One died following a period of apnoea which occurred very soon after his admission, before the right diagnosis had been made.

For permission to report these cases we are grateful to Dr. H. L. Ellis, Dr. B. D. Bower, Mr. B. H. Colman, and Mr. W. S. Lund, the consultants under whose care the patients were admitted. We are also indebted to other colleagues in the departments of paediatrics and otolaryngology, to Dr. R. H. Cowdell and Dr. D. J. de Sa for the necropsy reports, and to the patients' family doctors.

Requests for reprints should be addressed to Dr. D. C. Turk, Gibson Laboratories, Radcliffe Infirmary, Oxford OX2 6HE.

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Measurement in Medicine

Experiences with Outpatient Medical Questionnaires

G. H. HALL

British Medical Journal, 1972, 1, 42-45

Five years ago I began to use a questionnaire in the medical outpatient department. The original objectives were to reduce the time spent in routine questioning and to spend more time on analysis of the primary symptoms. Since then I have modified the questionnaire several times in the light of experience and have come to use the forms as guides to diagnosis. This paper gives an account of my experiences.

Material and Methods

There are two clinics a week, each lasting about three hours. About 650 new patients attend each year. The crude diagnostic breakdown is shown in Table I. The waiting time for a new patient is three to four weeks. The questionnaire is sent to the patient with his appointment and he is asked to complete it before coming to the clinic. Before seeing the patient I read the referral letter (usually from a general practitioner, occasionally from fellow specialists) and glance at the questionnaire. I then discuss the main complaint with the patient and

deal with affirmative answers on the form. The completed form is filed with the case notes. Recently I have adopted a similar routine with my private patients.

TABLE I—*Diagnostic Analysis of 631 new Outpatients seen during March 1970 to March 1971*

Gastrointestinal disorder	124	Thyroid abnormality	34
Diabetes mellitus	104	C.N.S. disorder	27
Rheumatism	64	Blood disorder	26
Vascular abnormality	62	Respiratory disorder	20
Urogenital system	56	Endocrine/metabolic disorder	17
Neurosis	46	Skin disorder	11
Heart disorder	40		

Results

The first form was modelled on a rubber stamp I had previously been using, and the answers were filled in by me. A brief explanation of the purposes of the form was followed by basic data and a series of questions with alternative possible answers. The appropriate answer was to be underlined. Spaces were left for remarks and past history and a table for family history, based on that used by insurance companies, was included.

I soon found that no objection was raised by the patients to the completion of these forms and that relatively many of them were able to answer the questions sensibly. I was spared the time and tedium of routine questioning, and the way in

which the forms were completed often gave useful insight into the education and personality of the patients.

The successful introduction of the first form stimulated

me to devise a more comprehensive questionnaire including data on occupation and dwelling places and a wider range of questions dealing with what I thought were the commoner conditions met in the clinic. I hoped that inquiries about medication and the patient's own view of his illness might be informative, but this proved not to be the case. Providing a Yes/No style of question was designed to simplify the answering procedure, but the typographical format proved unfortunate. The form was therefore rearranged (Fig. 1) to place the questions and answers more closely together.

By this time another benefit became apparent—that patients were often willing to give information in writing which they were reluctant to impart face to face. As an example I quote verbatim a touching autobiography of a patient who was tongue-tied at interview.

"This disc trouble started in 1952, went to Mrs. B. the osteopath at P—— who did me a lot of good but had to keep going back for Electric Treatment which did me a lot of good and helped me a great deal, but made me want sex which of course I could not have as My Husband did not have intercourse with me once in the whole of the eleven years I was married to him, but to my shame and ignorants I lost my virginity in my early twenties, but never had the full intercourse and flour from any man. So have had a very frustrating life. So hope you will understand and get me right, have suffered so much pain."

Furthermore, an admission of intimate difficulties on the form would be taken as an invitation to discuss them further at interview without embarrassing preliminaries.

As experience accumulated certain omissions and redundancies became obvious. For example, no mention was made of thirst or of joint pains, both common complaints in common conditions. I was also intrigued by the possibility of constructing a comprehensive diagnostic questionnaire, though I had been discouraged by the formidable size and appearance of the ones available—for example, the Cornell Medical Index. Before reconstructing my own form, however, it was clearly necessary to analyse systematically both the symptoms and the diagnoses of the patients attending my clinic. To do this the available case notes had to be withdrawn from the records department and the primary complaints and diagnoses transcribed on to the questionnaires.

The results of this exercise were surprising in their banality. Like most clinicians I tend to be interested by the exceptional and the rare and was therefore rather disappointed to find that the vast majority of my outpatient work indeed dealt with common conditions. Peptic ulcer, diabetes, rheumatism, neurosis, and cardiovascular insufficiency made up more than 80% of my cases.

I decided to test the ability of the form to distinguish the four conditions most often encountered and to attempt to devise an improved list of questions if necessary. Altogether 257 questionnaires were retrieved from the 307 traceable case notes of the 333 new patients who attended between January and June 1968. Because more than one diagnosis would confuse the issue only the 165 questionnaires from patients with one diagnosis were studied. The commonest conditions in this group were: peptic ulcer in 21 cases (13%), diabetes in 19 cases (11%), neurosis in 18 cases (11%), and rheumatism in 17 cases (10%).

To augment these numbers before statistical analysis extra forms from patients seen in 1967 with these conditions were added. The proportion of positive answers to questions 12-30 was ascertained (Fig. 2). The differences of profile, easily detected by eye, were shown to be significantly different by the χ^2 test—diabetes and rheumatism, P 0.025; diabetes and neurosis, P 0.05; rheumatism and neurosis, P 0.005; duodenal ulcer and diabetes, P 0.005; duodenal ulcer and rheumatism P 0.001; duodenal ulcer and neurosis, P > 0.1. It was clear, however, that many fewer questions would have sufficed to distinguish them. Reference to the original case notes gave the spontaneous complaints listed in Table II.

EXETER & MID-DEVON HOSPITALS MANAGEMENT COMMITTEE

ROYAL DEVON & EXETER HOSPITAL
Out Patients - Dr. G.H. Hall

We are trying to find ways of reducing the waiting time, both for appointments and in the clinic. If you can complete this form it will help us to do this. Simply fill in the blank spaces and ring the appropriate answer, "Yes" or "No" to the questions. Do this before you come to the clinic, and bring the form with you. All the information you give will be treated as confidential.

NAME: _____ AGE: 43

MAIN COMPLAINTS: 1. BACK PAIN SINCE 1910 JANUARY
2. DYSPEPSIA SINCE " "
3. HEART PROBLEMS SINCE " "

PRESENT AND PAST OCCUPATIONS:
4. 1910-1912 CLERK
5. 1912-1914 CLERK
6. _____

DWELLING PLACES: 7. 1910-1912
8. 1912-1914
9. 1914-1916

PAST ILLNESSES: 10. Anaemic Fe-def. ? came

PAST OPERATIONS: 11. _____

IN THE LAST 3 MONTHS HAVE YOU HAD ANY:-

12. Loss of weight?	Yes	No	25. Weakness or tiredness?	Yes	No
13. Gain in weight?	Yes	No	26. Swelling of the ankles?	Yes	No
14. Loss of appetite?	Yes	No	27. Tablets from your Doctor?	Yes	No
15. Constipation?	Yes	No	28. Tablets bought by yourself?	Yes	No
16. Diarrhoea?	Yes	No	29. Sleeplessness?	Yes	No
17. Pain in the tummy?	Yes	No	30. Extra business, family or personal worries?	Yes	No
18. Trouble with your water?	Yes	No	What do you think is wrong with you?	?	
19. Change in colour of urine?	Yes	No	What do you think caused this?	?	
20. Trouble with your periods?	Yes	No			
21. Change in sexual activity?	Yes	No			
22. Shortness of breath?	Yes	No			
23. Pain in the chest?	Yes	No			
24. Headaches?	Yes	No			

P. T. O.

FAMILY HISTORY:

Relative	If alive		If dead	
	Age	State of Health	Age at death	Cause of death
Father			66	Coronary Thrombosis
Mother			44	Pneumonia
Brothers				
Sisters	55			
Children	18	NORMAL		
	14			

ANY OTHER REMARKS YOU THINK MAY BE HELPFUL:

FOR OFFICE USE ONLY

Date Attending: _____ Hospital Number: _____

Provisional diagnosis: _____ Final diagnosis: _____

FIG. 1—Third form, front and back.

FIG. 2—Frequency of positive answers to questions 12-30 (forms 2 and 3) in four conditions. N=Number of patients in each group.

TABLE II—Percentage of Positive Answers found in Original Case Notes

	Duodenal Ulcer	Rheumatism	Neurosis	Diabetes Mellitus
Abdominal pain ..	85		11	
Vomiting ..	50			
Pain in limbs ..		100		18
Fatigue ..			55	

The additional specific question about excessive thirst would greatly help definition of the diabetic group. With such considerations in mind the latest questionnaire (Fig. 3) was drawn up. In practice this still remains imperfect, and I shall delete the questions to which the proportions of positive answers are either less than 20% or more than 80%. The question "Why did you go and see your doctor?" has proved much more informative than the old "Main complaint?". The answers to the latter were usually couched in hearsay medical terms and of little value. I shall in future include questions on smoking and drinking habits (as included on the original form), and the suffix P.T.O. is vital if the reverse of the form is to be completed in all instances.

Discussion

I have found that questionnaires are more acceptable to patients than to doctors. The latter generally reject the idea as too mechanistic and erosive of the mystique of anamnesis. I would counter this objection by my observation that by using the form I can spend relatively more time discussing the principal symptoms without getting stultified and stupefied by the necessary chore of routine questioning. It is surprising, perhaps, that so little is written about the rationalization of history taking, since it comprises such a large part of a physician's work. Certainly the patient should be allowed to tell his story in his own way, but his account can be written just as well as spoken, and indeed may gain in clarity from being written. I believe that it is essential, however, that the questionnaire be completed at home so that the patient has plenty of time to do it properly. Oral examinations usually give worse results than written examinations because of the unfamiliar environment and pressure of time.

Ideally, questionnaires should be simple, unambiguous, comprehensive, and discriminatory, but it is impossible for

IT WILL BE VERY HELPFUL AND SAVE TIME IF YOU CAN FILL IN THIS FORM AND BRING IT WITH YOU WHEN YOU ATTEND.
FOR THE YES/NO QUESTIONS, SIMPLY CROSS OUT THE ANSWER WHICH DOES NOT APPLY.
THIS INFORMATION GIVEN WILL BE REGARDED AS STRICTLY CONFIDENTIAL.

NAME _____ AGE 44
OCCUPATIONS: _____ DATE _____

WHY DID YOU GO AND SEE YOUR DOCTOR? To obtain help for a chronic illness

WHAT ILLNESSES AND OPERATIONS HAVE YOU HAD IN THE PAST? (WITH YEARS IF POSSIBLE)
Polypoid 1962

DURING THE LAST 3 MONTHS HAVE YOU NOTICED ANY:-

1. Loss of weight	Yes No	18. Shortness of breath	Yes No
2. Sweats, fever or chills	Yes No	19. Troublesome coughing	Yes No
3. Lumps anywhere	Yes No	20. Wheezing	Yes No
4. Unusual bleeding	Yes No	21. Pain in the legs	Yes No
5. Skin trouble	Yes No	22. Palpitation of the heart	Yes No
6. Unusual thirst	Yes No	23. Faints or blackouts	Yes No
7. Pain in your joints	Yes No	24. Headaches	Yes No
8. Loss of appetite	Yes No	25. Trouble with your eyesight	Yes No
9. Vomiting	Yes No	26. Deafness	Yes No
10. Indigestion	Yes No	27. Dizziness or giddiness	Yes No
11. Pain in the stomach	Yes No	28. Numbness or tingling in hands or feet	Yes No
12. Constipation	Yes No	29. Unsteadiness of the legs	Yes No
13. Diarrhoea	Yes No	30. Depression	Yes No
14. Change in appearance of urine	Yes No	31. Irritability	Yes No
15. Trouble with the monthly periods	Yes No	32. Difficulty in concentrating	Yes No
16. Change in sex life	Yes No	33. Forgetfulness	Yes No
17. Pain in the chest	Yes No	34. Extra worries	Yes No
		35. Excessive tiredness	Yes No

FAMILY HISTORY:

Relative	If alive		If dead	
	Age	State of Health	Age at death	Cause of death
Father			77	
Mother			90	
Brothers				
Sisters				
Children				

ANY OTHER REMARKS YOU THINK MAY BE HELPFUL:

Poor circulation and fidgets

FOR OFFICE USE ONLY

Date attending: _____ Hospital Number: _____
Provisional diagnosis: _____ Final Diagnosis: _____

FIG. 3—Current form, front and back.

a form to have all or even more than one of these qualities. It is doubtful, too, whether any single form can suit more than one clinician, so that those who propose to use one will probably have to devise one for themselves.

Answers should be capable of validation. We have to make the assumption that patients and doctors mean the same thing when using the same word. It is not feasible to discuss definitions of every word used in a clinical setting—or any other for that matter—and one has to take as much for granted in this respect while listening as when reading. With a completed form, however, one's attention can be restricted to the affirmative answers, and clarification can be obtained there.

Though I have illustrated how these forms may be used for proleptic diagnosis I have not so far employed them in this way. A preliminary inspection, however, may indicate a need for certain investigations which could usefully be carried

out before the interview. Furthermore, if patient screening has to be carried out by non-medical personnel, models of this sort may find an application. Questionnaires with a smaller range but greater depth may find a place in differential diagnosis in the subspecialties.

It must be admitted that the procedures described here are unsophisticated and the methods used in drawing up the forms empirical and heuristic. Probably this is unavoidable in a medical context. But any help in the difficult task of categoriza-

tion of raw symptom data into manageable medical concepts is not entirely to be despised.

I would like to thank Mr. W. W. Knott, records officer, and his staff for their great help in the production and handling of the questionnaires. The arduous task of record abstraction was carried out by the late Dr. S. Simpson, and the extra secretarial work by Miss J. Brooking and Miss A. Mylles. The case histories recorded in Figs. 1 and 3 are fictional.

Any Questions?

We publish below a selection of questions and answers of general interest

Precautions for Travel in Northern Scandinavia

What medical hazards might be encountered when holiday camping in Swedish Lapland and Finmark? What inoculations are necessary, and what drugs might usefully be taken?

In certain areas along the Torne river guests are sometimes served uncooked fish which may be infected by the tapeworm *Botriocephalus latus*. A few cases of hare-plague (tularemia) occur in northern Scandinavia, but the risk is only very slight of a man contracting this disease. In the past, echinococcosis in reindeer (dogs being the intermediate hosts) was not uncommon, but I consider the risk of this infection occurring nowadays in man to be extremely low. However, travellers should avoid close contact with dogs in Lap communities.

Bears and wolves do occur in northern Scandinavia but far away from roads and camping sites. Mosquitoes are large and plentiful and, with midges, may be troublesome for the traveller when trout- and salmon-fishing in the midnight sun in northern Norway. I have survived some 20 expeditions of exploration in these lonely, wild areas of unspoiled nature and have no hesitation in drinking the water from brooks or rivers. I regard the sum of all the hazards mentioned to be much less than those facing the Mediterranean traveller. There is no need for special drugs except for an insect repellent for the king-size mosquitoes, and no inoculations are necessary. Some people may find an eyemask of help in sleeping in the midnight sun.

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Notes and Comments

Hydrofluoric Acid Burns.—DR. R. A. TREVETHICK (British Steel Corporation Special Steels Division, Rotherham, Yorks) writes: Your Expert's answer to this question ("Any Questions?" 28 August, p. 526) quotes the classical treatment which has been generally accepted for many years in this country. The Americans have recently abandoned the use of calcium gluconate injections though still adhering to the use of magnesium oxide paste. The treatment now recommended varies from your Expert's answer in two respects:¹ (1) The area of skin burnt should be deluged in ice cold water if available because of the anaesthetic effect; (2) Soaks of 2% iced solution of Hyamine 1622 (benzethonium chloride) should be continued for 2-4 hours, and then followed by magnesium oxide paste. Hydrofluoric acid burns are relatively rare and it is difficult to arrange a controlled trial of the methods available. Undoubtedly calcium gluconate does not always produce the desired effect, and the new method deserves a trial.

OUR EXPERT replies: I thank Dr. R. A. Trevethick for his helpful comments on the early treatment of hydrofluoric acid burns with Hyamine 1622 (benzethonium chloride). A few of the high-molecular weight, quaternary ammonium salts, or cationic surface active agents have been used for the initial treatment. These include cetrimide (cetyltrimethyl ammonium bromide),² Zephiran (benzalkonium chloride),³ and Hyamine (benzethonium chloride).⁴ All Americans have not abandoned the use of calcium gluconate and the most recently published American opinion³ recommends the use of calcium gluconate for the more severe burns reserving Hyamine for the minor burns.

A fatal dose of Hyamine is estimated⁵ at 1 to 3 g, and this would be equivalent to 50 ml to 150 ml of a 2% solution. It is known that some substances can be absorbed into the circulation quite readily from a burned surface so that great care has to be taken in choosing any local preparation applied to the surface of a burn. A 0.2% solution has been recommended for application to hydrofluoric acid burns⁴ but as far as I am aware no blood levels of Hyamine have been performed and there is little guidance as to the exact weight of Hyamine which can be safely applied to the surface of a burn in a given time. Assuming that one molecule of Hyamine (molecular weight 448) combines with one molecule of hydrofluoric acid (molecular weight 20), about 2 l. of a 0.2% solution of Hyamine would theoretically be required to neutralize 1 ml of a 20% solution of hydrofluoric acid. This is about 4 g of Hyamine, well above a fatal dose. Only about 20 ml of a 10% solution of calcium gluconate would be required to have the same effect and this is much safer.

Whether the above theoretical considerations are correct "in vivo" is unknown, but if Hyamine is to be used it would be wise to limit the total dosage given until evidence is obtained as to the toxicity of Hyamine when applied to hydrofluoric acid burns. My reply laid more stress on the general and surgical management of hydrofluoric acid burns because of my doubt as to the effectiveness of the local agents which have been used in the past. However, Hyamine and calcium gluconate are worthy of trial but care should be taken of the dosage.

¹ Reinhardt, C. F., Hume, W. G., Linch, A. L., and Wetherhold, J. M., *American Industrial Hygiene Association Journal*, 1966, 27, 166.

² McColl, J. D., *Transactions of the Association of Industrial Medical Officers*, 1962, 12, 6.

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⁴ Wetherhold, J. M., and Shepherd, F. P., *Journal of Occupational Medicine*, 1965, 7, 193.

⁵ *Extra Pharmacopoeia*, Martindale, 25th edn. London, Pharmaceutical Press, 1967.