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The Diagnosis of Ischaemic Heart Pain and Intermittent Claudication in Field Surveys *

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Hospital studies were used to identify those characteristics of angina pectoris, cardiac infarction and intermittent claudication which most effectively distinguish these conditions from other causes of chest or leg pain. These are used to formulate precise definitions for epidemiological use and to form the basis of a standardized questionnaire.

Agreement on the use of such a questionnaire would permit international comparisons of the prevalence of these conditions, as defined. This would not hinder the collection of additional information, as required in particular studies.

As compared with physicians' diagnoses, the questionnaire had high specificity and reasonably good sensitivity. Interpretation of subjects' answers presents no serious difficulties. There is evidence that the diagnosis of angina pectoris presents special problems in populations with a high prevalence of chronic bronchitis.

Both clinicians and epidemiologists need clear definitions of the diseases which they study; but the purposes for which they need them may be very different. The clinician, recognizing the great variety that may be encountered in a single disease, and anxious if possible to make a correct diagnosis for each individual patient, seeks a broad definition which will cover most of the foreseeable varieties of the disease. He then has to trust to his own judgement and experience to reject false cases, and the processes by which he does this may be too complex for precise formulation.

The epidemiologist, on the other hand, is not as a rule primarily concerned with the individual patient. Admittedly he does not want to exclude genuine cases if he can avoid it, lest the prevalence rate which emerges from his survey should be unduly low—but this is not his primary concern. It is much more important to him that all his diagnostic principles shall be clearly delineated in advance, that they shall be simple enough to be embodied in a straightforward questionnaire, and that their interpretation in practice shall not depend upon such unpredictable variables as the personal judgement of a physician. In order to achieve these ends he may be forced to adopt a restrictive definition but he thereby gains precision and reproducibility of diagnosis. He may fail to recognize all the cases in his sample population, but he can hope to achieve a truly objective index of disease, and his results can be compared with those obtained from other surveys in which the same techniques have been used.

In epidemiological studies of ischaemic heart disease most investigators have depended for the identification of cases primarily on electrocardiography. This has the great advantage that techniques are well standardized and that, with care, the results can be handled in a reasonably objective manner. However, it is not without its limitations. It diagnoses only a proportion of cases: even in hospital series as much as 40% of patients with angina pectoris may have normal tracings at rest, and it is possible that in the general population this proportion might be higher. Furthermore, it may be that angina pectoris and cardiac infarction do not always indicate the same disease process and hence that they may have different epidemiological characteristics.

For these reasons it seems worth while to include in cardiovascular surveys a scheme for diagnosing angina pectoris. This has, of course, already been undertaken in a number of studies, but hitherto there has been no agreement about diagnostic criteria and techniques and no attempt to establish these upon a factual basis.

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THE WHO DEFINITION OF ANGINA PECTORIS

The WHO Expert Committee on Cardiovascular Diseases and Hypertension [1] defined angina pectoris as follows:

"A pain, occurring centrally in the front of the chest at the mid- or upper-sternal level brought on by effort (e.g., exercise, emotional stress, ingestion of food, or exposure to cold). It may radiate to the left arm or both arms, round the chest or into the neck or jaw. It is described as 'tight', 'heavy', 'constricting', or 'crushing', but it may also be described as 'numbing' or 'burning'. It is relieved within a few minutes after cessation of effort or taking of sublingual nitroglycerin."

Unfortunately it does not seem to be possible to use this definition as the basis for specific diagnostic criteria, for it provides a general rather than a precise guide. Recognition of this is implicit in the Committee's plea that the history should be taken by "an experienced physician". But for epidemiological surveys it is very important that diagnosis should not depend on the judgement and viewpoint of the examiner, for these will be affected by his previous experience and attitudes and will certainly vary greatly from one country to another.

Some particular points about the definition may be mentioned.

(1) The listing of optional sites for the pain avoids the question of what sites—if any—are to be regarded as obligatory.

(2) Physical effort is not defined, but only illustrated by an open-ended series of examples which include emotion and eating. A burning substernal pain felt only after meals would pass all the definition's requirements for angina.

(3) No stress is laid on the regular pattern of provocation of attacks by physical exercise; nor is there mention of the fact that pain compels rest.

AIMS OF THE PRESENT STUDY

The first part of the present study was aimed at determining the precise characteristics of the pain experienced by hospital patients with ischaemic heart disease and of those features which can most effectively distinguish it from other types of chest pain. A definition of angina pectoris derived from this information is proposed. Next, a simple questionnaire is described, shaped around the criteria laid down in the definition, and some experience in the field use and validation of this questionnaire is outlined. Similar techniques have been extended to the study of intermittent claudication; this addition is held to be justified because of its association with atheroma and because its well-delineated characteristics make it very suitable for diagnosis in surveys.

THE DISTINCTIVE FEATURES OF ISCHAEMIC HEART PAIN AND INTERMITTENT CLAUDICATION

Most physicians would agree that Heberden's description of classical angina pectoris could hardly be bettered. It is also, however, recognized that there can be many variations of the classical picture, and the frequency of these variations is uncertain. Furthermore, physicians tend to encourage their patients to give descriptions which fit the accepted mould. For both these reasons it seemed desirable to put to a group of patients with known angina pectoris a series of questions, strictly non-leading in their phrasing, which would cover as many as possible of those characteristics of anginal pain which might prove diagnostically helpful.

A "fact-finding" questionnaire was therefore drawn up and this has been applied to:

(1) 36 consecutive patients considered, after full hospital investigation, to have unequivocal angina due to ischaemic heart disease: almost all had electrocardiographic evidence of ischaemia;

(2) 15 consecutive patients who had had proven cardiac infarction but had not suffered from angina; and

(3) 23 consecutive patients with pain in the chest believed, after full hospital investigation, not to be due to organic heart disease. The diagnoses of the last group are listed in Table 1, and the age and

TABLE 1

DIAGNOSES IN 23 HOSPITAL PATIENTS WITH CHEST PAIN CONSIDERED, AFTER FULL INVESTIGATION, TO BE DUE TO CAUSES OTHER THAN ORGANIC HEART DISEASE

Diagnosis	Number of patients
Chronic bronchitis	8
Pleurisy	6
Peptic ulcer, heartburn	3
Hiatus hernia	1
Neurosis	2
Other	3

[1] World Health Organization, Expert Committee on Cardiovascular Diseases and Hypertension (1959) *Wld Hlth Org. techn. Rep. Ser.*, **168**, 15.

TABLE 2
AGE AND SEX CHARACTERISTICS OF THE VARIOUS GROUPS OF HOSPITAL PATIENTS

Group	Age (years)		Sex		Total number
	Mean	S.D.	Number of men	Number of women	
Angina pectoris	56.2	9.4	30	6	36
Cardiac infarction	55.7	11.5	15	0	15
Non-cardiac chest pain	49.3	13.7	20	3	23
Intermittent claudication	57.1	7.9	32	5	37
Other leg pain	48.2	13.4	15	3	18

S.D. = Standard deviation.

sex characteristics of all three groups are shown in Table 2.

The section of the questionnaire dealing with leg pain was applied to 37 patients with undoubted intermittent claudication (most of whom had had arteriograms) and 18 patients with other types of leg pain on walking (mainly sciatica, osteoarthritis and calf cramps). Table 3 lists the frequency of positive answers given by the different groups of subjects in reply to the various questions.
The principal findings were as follows.

Site of pain

In 89% of anginal subjects pain was felt in either the sternal area or the left anterior chest and left arm. Only 61% of non-coronary patients described pain in one or other of these areas.

Severity

The subjects' assessment of severity of pain proved too variable to be of help in the diagnosis of angina: the most recent attack was described by 39% as a discomfort, by 36% as a slight pain, and by 25% as a severe pain. On the other hand, 87% of patients with infarction said that their pain was severe.

Quality

The patients with angina had great difficulty in describing the quality of their pain, for at least two reasons. In the first place, many remarked that it was quite unlike any pain previously experienced; and secondly, its quality varied according to how soon the patient rested and according to the particular stage of the attack, and it was often different in the various sites to which pain was referred.

The patients' views were tested in two ways. Each was first asked " what was it like ? " and the answer was recorded verbatim. The essentials of these answers are listed in Annex 1. This list illustrates the difficulties which the patients had in trying to find adequate words to describe their experience. It also illustrates the difficulty which an interviewer would have in assigning many of the answers to a limited classification. Patients were also asked to say " yes " or " no " to the appropriateness of each of a series of terms describing quality of pain (see Table 3). The proportions of positive answers were remarkably similar for cases and controls. Anginal patients showed a slight preference for " tightness " and infarct patients for " pressure "; but taking the answers as a whole the three series do not differ significantly from one another (χ^2 test, $n = 7$, $P > 0.9$ for angina versus control, and also for infarct versus control).

Nearly half the cases considered " stabbing " to be an appropriate description of their pain. This was unexpected, since it is widely held that the character of anginal pain is never stabbing. It was often difficult, even after careful inquiry, to learn exactly what a patient meant by the use of a particular word; but in some instances at least it was clear that " stabbing " was meant to imply only an experience like that of a knife thrust in and left stationary, not one of repeated thrusts.

These findings suggest that even in comparisons within a single hospital the quality of pain did not discriminate usefully between cardiac and non-cardiac disease. In international comparisons the difficulties would be multiplied many times, for even between English-speaking countries there may

TABLE 3

FREQUENCY OF POSITIVE ANSWERS TO CERTAIN QUESTIONS ON THE NATURE OF CHEST PAIN OR DISCOMFORT AMONG CASES OF ANGINA PECTORIS (36 PATIENTS), CARDIAC INFARCTION (15 PATIENTS) AND NON-CARDIAC CHEST PAIN (23 PATIENTS)

Characteristic of pain	Frequency (%) of positive answers		
	Angina pectoris	Non-cardiac pain	Cardiac infarction
Site:			
Upper sternum	14	9	13
Mid-sternum	67 } 86	43 } 61	74 } 87
Lower sternum	19	22	20
Right anterior chest	25	26	40
Left anterior chest	56	70	40
Right arm	11	4	34
Left arm	36	4	46
Neck or jaw	14	4	0
Other	11	17	13
Severity:			
Discomfort	39	39	0
Slight pain	36	39	13
Severe pain	25	22	87
Quality:			
Steady	67	61	54
Stabbing	42	43	46
Tightness	81	61	60
Ache	67	52	54
Throbbing	19	17	13
Pressure	58	52	67
Burning	28	22	20
Numbing	22	13	20
Activity at onset of latest attack: [a]			
Walking	44	17	7
Active, not walking	25	22	13
Stationary	28	43	80
Duration of latest attack:			
10 minutes or less	72	17	0
More than 10 minutes	25	83	100
Attacks provoked by:			
Exertion	92	22	—
Emotion	8	0	—
Walking uphill	72	13	—
Walking on flat normal pace	61	13	—
Walking on flat, slow pace	28	4	—
Usual response of patient to pain:			
Stop	83	17	—
Slacken pace	11	0	—
Continue	3	4	—
Usual response of pain to rest:			
Not relieved	0	4	—
Relieved within 10 minutes	92	9	—
Relieved after 10 minutes	3	9	—
Occurrence of rest pain:	75	43	—
Emotionally provoked	42	17	—
Attack(s) sometimes lasting 30 minutes or more	45	70	100

[a] Deficiencies here and subsequently due to inability of some patients to answer all questions.

be large differences in the meaning of words used to describe a subjective experience. To make any particular quality of pain an obligatory criterion for diagnosing angina would exclude many genuine cases; it would still permit the entry of many false ones; and it would severely limit the comparability of results from surveys among different populations, especially those with different languages.

Provocation by exertion

The regular provocation of pain by physical exertion was, of course, a major feature in nearly all anginal subjects. The same feature was reported by 22% of patients with non-cardiac pain—principally by those with disabling chronic bronchitis (see Annex 3 (4)).

Response of patient to pain

Only one anginal patient said that when pain began he could carry on at the same pace: he was able to do this only because he always took trinitrin (nitroglycerin).

Response of pain to rest

It was found among both cases and controls that if exertion provoked pain, then rest relieved it. Hence the mere fact of relief after rest does not assist discrimination. However, all but one of the anginal subjects obtained relief in 10 minutes or less, whereas non-anginal pain tended to last much longer.

In its site and quality the pain of cardiac infarction seemed to resemble angina. Its distinctive features were that it was described as " severe " by all but 2 patients and that in all patients its duration was estimated to have been 30 minutes or longer. (This refers, of course, only to this particular group of diagnosed and surviving hospital patients.)

As had been expected, the diagnosis of intermittent claudication presented few difficulties. Of the 37 patients with intermittent claudication, 34 (92%) met the criteria which are presented on page 649; none of the 18 control patients fulfilled these criteria.

PROPOSED DEFINITIONS

The information obtained in this first stage of the study provided evidence on the extent to which various features (1) were typical of angina, painful cardiac infarction, and intermittent claudication (as they are diagnosed in hospital patients) and (2) served to distinguish these conditions from some other type of chest and leg pain. In using this infor

mation to formulate definitions, a certain amount of arbitrary judgement is required. At one extreme a definition may be very strict: it will then have high specificity but low sensitivity. At the other extreme it may be relatively lax: few cases will then be missed but there will be more false positives.

A compromise can be reached by having two categories, one " hard " and the other " soft ". However, this raises the problem of the value of information obtained under the " soft " category—at least, so far as prevalence surveys are concerned. Presumably it could not be used at all unless it had some independent support, as, for example, from electrocardiography: it is of little value to know the prevalence in a population of " possible angina ". If independent evidence is available, there seems little gain in having additional evidence about an uncertain clinical condition. For this reason, only one set of diagnostic criteria has been formulated and this has been made relatively strict. The use of optional additional questions can cover the needs of those requiring wider information. The following definitions are proposed for epidemiological use:

Angina pectoris

" A chest pain or discomfort with these characteristics:

(1) The site must include *either* the sternum (any level) *or* the left arm and left anterior chest (defined as the anterior chest wall between the levels of clavicle and lower end of sternum).

(2) It must be provoked by either hurrying or walking uphill (or by walking on the level, for those who never attempt more).

(3) When it occurs on walking it must make the subject either stop or slacken pace, unless trinitrin (nitroglycerin) is taken.

(4) It must disappear on a majority of occasions in 10 minutes or less from the time when the subject stands still."

Of the 36 cases of angina reported above, 29 (81%) satisfied these criteria, as compared with 2 (9%) of the 23 patients with other types of chest pain; both these had disabling chronic bronchitis.

Possible cardiac infarction

Cardiac infarction is clinically less distinctive than either angina pectoris or intermittent claudication, but the following definition of the pain of possible infarction is suggested: " One or more attacks of severe pain across the front of the chest lasting for 30 minutes or longer ".

Of the 15 patients with infarction but no angina who answered the questionnaire, 13 complied with this definition. Of the 23 cases of non-cardiac chest pain, only 2 met the criteria: one had a hiatus hernia and the other had chronic bronchitis.

Intermittent claudication

" A leg pain with the following characteristics:

(1) Its site must include one or both calves.

(2) It must be provoked by either hurrying or walking uphill (or by walking on the level, for those who never attempt more).

(3) It must never start at rest.

(4) It must make the subject either stop or slacken pace.

(5) It must disappear on a majority of occasions in 10 minutes or less from the time when the subject stands still.

(6) It must never disappear while walking continues."

Of the 37 patients with intermittent claudication who answered the questionnaire, 34 (92%) met all the criteria of this definition. Of the 18 control patients none met the criteria.

A CARDIOVASCULAR QUESTIONNAIRE FOR FIELD USE

A questionnaire has been prepared of which the primary function is the ascertainment of whether a person has or has not had " angina ", " possible infarction " or " intermittent claudication ", as defined above. The essential questions have been taken with little or no change from the " fact-finding" questionnaire already outlined (see pages 646-648).

This questionnaire has now been applied to over 2000 subjects, and experience has led to a number of minor modifications. The version in current use is shown in Annex 2. Section A, which deals with angina, presents first the essential diagnostic questions. It is recognized that individual investigators may wish to collect additional information and an opportunity to do this is presented by a short section for optional supplementary questions to be asked *after* the main part of Section A. The choice of supplementary questions is, of course, an individual matter. It is possible that information derived from these supplementary questions may permit the future identification of other characteristic syn-

dromes of cardiac pain. Section B deals with " possible infarction ", and again there is an opportunity for the recording of supplementary information. Section C deals with intermittent claudication.

The questionnaire as it now stands embodies the results of discussions with many other workers in this field, and it is put forward in the hope that as many more investigators as possible will make their comments and criticisms upon it. Only if agreement can be reached, not merely on diagnostic criteria but also on standardized questionnaire technique, can we hope to achieve results that will be of value in international comparisons.

Annex 1

ANSWERS GIVEN BY 36 PATIENTS WITH ANGINA PECTORIS TO THE QUESTION " WHAT WAS IT LIKE ? "

1. " Not much hurt, but affected everything."
2. " Like a spasm of pain. Indigestion."
3. " Excruciating pain in chest, gnawing in arm."
4. " Dull ache."
5. " An iron hand squeezing."
6. " Kind of a pricking."
7. " Dull ache."
8. " Like a knife."
9. " Like a vice."
10. " Pins and needles."
11. " Like something pressing."
12. " Like a lot of hot fuse-wire round, being pulled at both ends."
13. " Like something catching hold of you."
14. " Can't explain it. Had palpitations."
15. " A tight band."
16. " Like something stopping and starting."
17. " Dull ache."
18. " Sore."
19. " Gripping taut pain."
20. " Something tearing away. Or sometimes tightness. Choking feeling."
21. " Burning pain."
22. " A force pressing on you."
23. " Burning pain."
24. " Can't describe it."
25. " Dull heavy pain."
26. " Steady stabbing."
27. " Sometimes like a knife."
28. " Sometimes tightness, sometimes stabbing. A sharp pain at times."
29. " Like a knife, stabbing."
30. " Boring, sharp."
31. " Gripping, occasionally sharp."
32. " Something trying to get through. Sharp."
33. " Steady. Poignant."
34. " Rapid pulsation causing leaden pain."
35. " Sharp shooting, leaving a dull ache."
36. " Good sharp pain, like two bricks."

Annex 2

CARDIOVASCULAR QUESTIONNAIRE VI

INSTRUCTIONS TO INTERVIEWERS

The purpose of the questionnaire is to standardize the identification of " angina of effort," " pain of possible infarction," and " intermittent claudication," *as defined.*

The questionnaire will fail to identify some cases which the physician diagnoses with confidence, and it will diagnose others which the physician is satisfied are due to a quite different cause. Any special effort, however, to alter the conduct of the interview in such instances would destroy the basic purpose of the questionnaire technique, which is to ensure uniformity in the eliciting of defined symptoms.

Questions must be put to the subject exactly as they are printed: small changes may make unexpectedly large differences. Unequivocal answers must be recorded as such, whether they seem reasonable or not. Probing questions should rarely be

Put X in appropriate box

QUESTIONNAIRE

IDENTIFICATION

Office use

Surname..... Country ..... 1 ☐

First names ..... Survey ..... 2 ☐

Sample ..... 3 ☐

Subject ..... 4-7 ☐☐☐

Sex: Male ☐ 1 8 ☐

Female ☐ 2

Day Month Year

Date of birth ..... Age at interview ☐☐ 9-10 ☐☐

Place of birth ..... 11 ☐

Ethnic group ..... 12 ☐

S M W Div Sep

Civil status ..... ☐ ☐ ☐ ☐ ☐ 13 ☐

1 2 3 4 5

Interviewer ..... 14 ☐

Day Month Year

Date of interview ..... 15 ☐

16 ☐

17 ☐

18 ☐

19 ☐

20 ☐

SECTION A: EFFORT PAIN

Yes No

HAVE YOU EVER HAD ANY PAIN OR DISCOMFORT IN YOUR CHEST? ☐ ☐ 21 ☐

If *no*, HAVE YOU EVER HAD ANY PRESSURE OR HEAVINESS IN YOUR CHEST? ☐ ☐ 22 ☐

Office use

If *no*, proceed to Section B. If *yes*, ask next question.

If during the remainder of Section A an answer is recorded in a box marked *, proceed to Section A (Optional) without asking any more Section A questions.

DO YOU GET IT WHEN YOU WALK UPHILL OR HURRY?
Yes ☐ 1
No ☐* 0
Never hurries nor walks uphill ☐ 2
23 ☐

Record *yes* if *either* walking uphill *or* hurrying causes pain or discomfort.

DO YOU GET IT WHEN YOU WALK AT AN ORDINARY PACE ON THE LEVEL? Yes ☐ No ☐
24 ☐

If *yes* to *either* of last two questions, ask

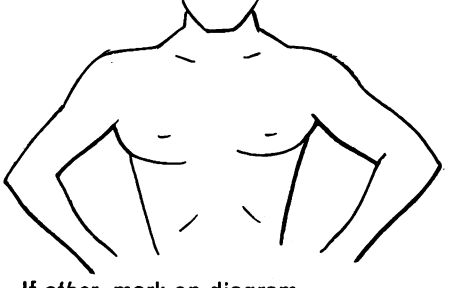
WHAT DO YOU DO IF YOU GET IT WHILE YOU ARE WALKING?
Stop or slow down ☐ 1
Carry on ☐* 0
25 ☐

Record *stop or slow down* if subject carries on after taking nitroglycerin (trinitrin).

IF YOU STAND STILL, WHAT HAPPENS TO IT?
Relieved ☐ 1
Not relieved ☐* 0
26 ☐

HOW SOON?
10 minutes or less ☐ 1
More than 10 minutes ☐* 0
27 ☐

WILL YOU SHOW ME WHERE IT WAS?



	Yes	No		
Sternum (upper or middle)	☐	☐	28	☐
Sternum (lower)	☐	☐	29	☐
Left anterior chest	☐	☐	30	☐
Left arm	☐	☐	31	☐
Other	☐	☐	32	☐

If *other*, mark on diagram.

DID YOU FEEL IT ANYWHERE ELSE? Yes ☐ No ☐
33 ☐

If *yes*, record additional information above.

Office use

SECTION A (OPTIONAL)

	Yes	No		*Office use*
HAVE YOU HAD THIS PAIN OR DISCOMFORT MORE THAN THREE TIMES?	☐	☐	34	☐
If *no*, proceed to Section B.				
DOES ANY OTHER KIND OF EXERTION BRING IT ON? (Specify)	☐	☐	35	☐
DO ANY OF THESE THINGS TEND TO BRING IT ON? PLEASE SAY YES OR NO TO EACH.	Yes	No		
EXCITEMENT OR EMOTION?	☐	☐	36	☐
STOOPING?	☐	☐	37	☐
EATING?	☐	☐	38	☐
BREATHING?	☐	☐	39	☐
COLD WIND?	☐	☐	40	☐
COUGHING?	☐	☐	41	☐
IS IT WORSE IF YOU HAVE A CHEST COLD OR BAD COUGH?	☐	☐	42	☐
WOULD YOU DESCRIBE IT AS A PAIN OR A DISCOMFORT? Pain ☐ 1 Discomfort ☐ 2			43	☐
WOULD ANY OF THESE WORDS DESCRIBE THE SENSATION? PLEASE SAY YES OR NO TO EACH.	Yes	No		
HEAVINESS?	☐	☐	44	☐
BURNING?	☐	☐	45	☐
TIGHTNESS?	☐	☐	46	☐
STABBING?	☐	☐	47	☐
PRESSURE?	☐	☐	48	☐

SECTION B: PAIN OF POSSIBLE INFARCTION

	Yes	No		*Office use*
HAVE YOU EVER HAD A SEVERE PAIN ACROSS THE FRONT OF YOUR CHEST LASTING FOR HALF AN HOUR OR MORE?	☐	☐	49	☐
If *yes*, ask				
HOW MANY OF THESE ATTACKS HAVE YOU HAD?			50	☐

	Date	*Duration*	*Other information*
First attack	.....	.....	.....
Latest attack	.....	.....	.....

Office use

HAVE YOU EVER HAD AN ELECTRICAL RECORDING OF YOUR HEART (ECG) FERFORMED? Yes ☐ No ☐ 51 ☐

If *yes*, ask WHERE? .....

WHEN? .....

DID YOU SEE A DOCTOR BECAUSE OF THIS PAIN? Yes ☐ No ☐ 52 ☐

If *yes*, ask WHAT DID HE SAY IT WAS? .....

SECTION C: INTERMITTENT CLAUDICATION

If an answer is recorded in a box marked *, no further questions need be asked.

DO YOU GET PAIN IN EITHER LEG ON WALKING? Yes ☐ No ☐* 53 ☐

DOES THIS PAIN EVER BEGIN WHEN YOU ARE STANDING STILL OR SITTING? ☐* ☐ 54 ☐

IN WHAT PART OF YOUR LEG DO YOU FEEL IT?

Pain includes calf/calves ☐ 1 55 ☐

Pain does not include calf/calves ☐* 0

If calves not mentioned, ask ANYWHERE ELSE?

DO YOU GET IT WHEN YOU WALK UPHILL OR HURRY? Yes ☐ 1

No ☐* 0 56 ☐

Never hurries or walks uphill ☐ 2

DO YOU GET IT WHEN YOU WALK AT AN ORDINARY PACE ON THE LEVEL? Yes ☐ No ☐ 57 ☐

If *yes* to *either* of last two questions, ask

DOES THE PAIN EVER DISAPPEAR WHILE YOU ARE STILL WALKING? ☐* ☐ 58 ☐

WHAT DO YOU DO IF YOU GET IT WHEN YOU ARE WALKING? 59 ☐

Stop or slacken pace ☐ 1

Carry on ☐* 0

				Office use	
WHAT HAPPENS TO IT IF YOU STAND STILL?					
	Relieved ☐ 1			60	☐
	Not relieved ☐* 0				
HOW SOON?	10 minutes or less ☐ 1			61	☐
	More than 10 minutes ☐ 0				
CONCLUSION					
Effort pain: If *yes* to (*a*) 28 *or* (*b*) 29 *or* (*c*) 30 *and* 31				62	☐
	If *no* to 24:	GRADE 1 ☐	1		
	If *yes* to 24:	GRADE 2 ☐	2		
		NO ☐	0		
"*Possible infarction*":	If *yes* to 49:	YES ☐	1	63	☐
	If *no* to 49:	NO ☐	0		
Intermittent claudication: If *10 minutes or less* to 61:		YES ☐		64	☐
	If *no* to 57:	GRADE 1 ☐	1		
	If *yes* to 57:	GRADE 2 ☐	2		
	If *more than* 10 *minutes* to 61:	NO ☐	0		

needed. When they have to be used, they should depart as little as possible from the wording of the initial question; and they must not be such as to suggest any one particular answer to the subject.

If serious doubt arises about the correct interpretation of a particular answer, it should be recorded in such a way as to *exclude* the suspected condition—for example: " Do you get it when you walk uphill or hurry? " " Well, I think I might do; but I can't really remember." This answer should be recorded as " No ".

The only exception to this rule is if the subject gives an equivocal answer to the initial question—for example: " Have you ever had any pain or discomfort in your chest? " " No. Only indigestion." This answer should be recorded as " Yes ", and the further questions should then be put.

Special notes

Question 21. Disregard the subject's interpretation of his symptoms. Answers of the type " No, except for indigestion " should be recorded as " Yes ".

Question 23. The answer must be interpreted strictly. Pain experienced only during some other form of exertion (e.g., cycling, stair-climbing, lawn-mowing) must be recorded as " No ". An opportunity to report this type of information is given later at Question 35.

Questions 23-28, 55-57 and 59-61. These refer to the usual characteristics of the pain or discomfort. Unequivocal answers need not be probed; but answers such as " Occasionally " or " Sometimes " should be probed by a question of the type " Does this happen on most occasions? ".

Annex 3

VALIDATION OF THE ANGINA QUESTIONNAIRE

(1) *Inter-physician and physician questionnaire, variation in diagnosis of angina*

A study of coronary disease was begun by Dr Oglesby Paul at the Western Electric Company in Chicago, USA, in 1957, based on annual interview and examination of male employees who at the start of the study were aged between 40 and 55 years, and had no evidence of ischaemic heart disease. 2107 men (72% of those eligible) agreed to participate, and 95% of these were still under surveillance three years later. The present study is based on 57 of these men, chosen because at one or more of their annual interviews they had reported pain in the chest.

These 57 men were recalled for interview by three physicians,[1] each of whom had some special interest and experience in the diagnosis of angina pectoris. Each interview lasted 15 minutes and each observer occupied each position in the interview sequence in rotation. None had access to any information except that provided by the interviewees themselves. No attempt was made to standardize interviewer technique, and results were not discussed between the physicians.

One of the physicians included in his interview the questions from the standard questionnaire (see Annex 2, page 650) and he recorded separately the "questionnaire diagnosis" and his own personal opinion.

The main results are given in Table 4. The three physicians diagnosed definite or probable angina in 26, 24 and 22 men (46%, 42% and 39%) respectively. The questionnaire diagnosed angina in 20 men (35%). The physicians agreed with each other on 75% of the subjects. Of the 26 unanimous "physician-negative" cases, all were classified negative also by questionnaire. Of the 17 unanimous "physician-positive" cases, 14 were similarly classified by questionnaire.

An opinion unsupported by either colleague was given in 6, 4 and 4 instances by the three physicians respectively. An opinion unsupported by any physician was given on only 3 occasions by the questionnaire.

It is concluded that in this particular situation the questionnaire diagnosis of angina showed reasonable (about 83%) sensitivity and high specificity as compared with diagnosis by physicians. The physicians' interviews occupied 15 minutes each, as compared with about 1 minute for the questionnaire.

TABLE 4

INTER-PHYSICIAN AND PHYSICIAN QUESTIONNAIRE: VARIATION IN THE DIAGNOSIS OF ANGINA PECTORIS BASED ON INTERVIEWS WITH 57 MEN WITH CHEST PAIN

Observer	Total	Opinion supported by (number and per cent.)			
		Neither colleague	One colleague only	Both colleagues	Questionnaire
		Diagnosis "A.P. positive"			
A	24	3 (12)	4 (17)	17 (71)	15 (63)
B	26	3 (12)	6 (23)	17 (65)	18 (69)
C	22	1 (4)	4 (18)	17 (78)	18 (82)
		Diagnosis "A.P. negative"			
A	33	3 (9)	4 (12)	23 (79)	28 (85)
B	31	1 (3)	4 (13)	26 (84)	29 (94)
C	35	3 (9)	6 (17)	26 (74)	33 (94)

(2) *Variations in technique of administering the questionnaire*

Provided interviewers are sufficiently aware of the importance of adhering to the questions as printed, differences in technique should arise only when an inadequate answer makes it necessary to ask a probing question.

A study was made of the tape-recordings of 100 consecutive interviews undertaken on English postmen by two trained medical observers. In Section A (angina) only 3 probing questions were used; in Section B (possible infarction) only 1; and in Section C (intermittent claudication), none.

It is concluded that, with trained observers and with this particular type of population, variations in interviewing technique are unlikely to be important.

(3) *Variations between observers in the interpretation of answers*

Tape-recordings were available of approximately 450 interviews with English postmen in the course of which this questionnaire had been used. From these were selected 9 in which the patients' answers met all

[1] Dr William Phelan, Dr James McElroy and the author.

the required criteria for angina pectoris, and 11 in which they met some but not all of the criteria. Between them these represented all the " problem cases " from the whole of this series of interviews. The recordings were played to 8 interviewers (5 doctors and 3 lay persons), and each one individually recorded answers on the record-sheets.

In 18 of the 20 interviews there was unanimity as to the presence or absence of angina. In 1 interview there was 1 dissenting opinion, due to mis-hearing of an answer. In the remaining interview 3 observers mistakenly recorded as anginal a subject who experienced pain only when cycling.

It is concluded that observer variation in the interpretation of answers is unlikely to be an important problem with this questionnaire. It is hoped that tests of reproducibility of the answers will be conducted shortly.

(4) *Diagnosis of " angina " in subjects with chronic bronchitis*

In the course of applying the angina questionnaire to a population with a high prevalence of chronic bronchitis (middle-aged British males) it has become clear that among the men in which " angina " was diagnosed there is an unduly high prevalence of bronchitic symptoms (see, for example, Tables 4, 5).

TABLE 5

PREVALENCE OF SPUTUM PRODUCTION FOR 3 OR MORE MONTHS EACH YEAR AMONG MEN WITH AND WITHOUT " ANGINA ".* AS DIAGNOSED BY QUESTIONNAIRE

	Sputum production positive	Sputum production negative	Total
" Angina " positive	21 (66 %)	11 (34 %)	32
" Angina " negative	220 (32 %)	466 (68 %)	686
	241	477	718

* English postmen aged 40-64 years.
$\chi^2 = 13.9$ $P < 0.001$.

This may mean that among men with chronic bronchitis there is a large excess of real angina; or it may be that bronchitic men often have an exertional chest pain, closely resembling angina, but due to chest disease and not to ischaemic heart disease. Further studies are in progress to elucidate this point.

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RÉSUMÉ

Cliniciens et épidémiologistes doivent disposer de définitions précises des cas qu'ils étudient, bien que le but de leurs recherches soit différent. Les études épidémiologiques sur les ischémies cardiaques, en particulier, ont été retardées, jusqu'à maintenant, par le manque de définitions précises des symptômes. L'auteur a cherché, dans une enquête portant sur 36 cas hospitaliers d'angine de poitrine, 15 d'infarctus et 37 de claudication intermittente, comparés à des cas d'autres maladies produisant des douleurs du thorax et des jambes, de préciser le caractère de la douleur accompagnant les maladies ischémiques, qui la distingue d'autres types de douleurs thoraciques. Les résultats de ces comparaisons l'ont conduit aux propositions suivantes:

Angine de poitrine : douleur ou sensation pénible ayant les caractères suivants: son siège comprend *soit* le sternum *soit* le bras gauche et le thorax antérieur gauche (paroi thoracique antérieure gauche entre la clavicule et la base du sternum). Elle est provoquée par une marche hâtive ou ascensionnelle ou une marche à niveau, dans certains cas. Lorsque le sujet la ressent en marchant, il s'arrête ou ralentit le pas, à moins qu'il ne prenne de la trinitrine. Elle disparaît le plus souvent en l'espace de 10 minutes si le sujet s'arrête.

Sur les 36 cas examinés, 29 (81 %) répondaient à ces critères, contre 2 (9 %) seulement sur 23 sujets souffrant d'autres formes de douleurs thoraciques. Ces deux cas étaient des bronchites chroniques incapacitantes.

Infarctus cardiaque éventuel : Une ou plusieurs douleurs violentes sur le devant du thorax, durant 30 minutes ou plus.

La *claudication intermittente* répond à des critères très proches de ceux de l'angine de poitrine. 34 des 37 cas (92 %) correspondaient à ces critères, mais aucun des 18 cas accusant des douleurs des jambes.

Pour que les symptômes puissent être comparés, il ne suffit pas de définitions convenues, il faut des techniques permettant de reconnaître ces symptômes. Un questionnaire a donc été établi, destiné à établir si les personnes consultées sont atteintes de l'une des trois affections précitées. Ce questionnaire n'apporte pas réponse à tout. Il ne représente qu'un minimum exigeable, et peut être étendu et complété.

Ce questionnaire a l'avantage d'être facile à remplir; il est rare que les réponses des malades soient difficiles à interpréter. Les réponses qu'il fournit ont été comparées avec les diagnostics portés par des médecins sur 57 cas de douleurs thoraciques signalées au cours d'une enquête. Dans 26 cas où les trois médecins avaient posé un diagnostic négatif quant à l'angine de poitrine, les questionnaires aboutirent tous à la même conclusion. Dans 17 cas où trois médecins avaient posé un diagnostic d'angine de poitrine, les questionnaires étaient dans le même sens, sauf pour 3 cas. Il semble donc que les questions entraînent des réponses hautement spécifiques et qu'elles soient raisonnablement sensibles. Il paraît cependant que le diagnostic d'angine de poitrine pose des problèmes particuliers dans les collectivités où la fréquence de la bronchite chronique est élevée.