Self-observation in general practice—the bleep method

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SUMMARY. Recent trends in general practice towards working in multi-disciplinary teams from purpose-built premises have emphasised the need to study the ways in which doctors and other staff spend their working time.

This paper describes a well-established work-study technique (activity sampling), which has been adapted to enable doctors to assess how they use their time. The method needs no observer and is cheap to operate. Five general practitioners undertook to record their surgeries for two separate weeks using the bleep method of activity sampling. The results they obtained show that the technique is both practicable in normal working conditions and is capable of providing information highly relevant to the management of general practice.

Introduction

The need for measuring accurately how a doctor uses his time arose during the initial phase of a before-and-after study on the reorganisation of surgery accommodation in general practice. It was necessary to have a reliable means of measurement, where error could easily be checked, and preferably where no observer was present during the consultation. It was also essential that the method of recording should have only minimal effect on the consultation. No reference could be found to any application of work measurement fitting these criteria.

Methods used in the past have provided some answers to the question of how time is spent in general practice. Techniques such as diary keeping and stop watch recording have been used, but generally for short-time periods and often involving difficult and time-consuming data evaluation.

Jeans (1965) reported that using a tape recorder he recorded five consultations and from his tape measured with a stop watch the time spent in different activities.

Parrish *et al.* (1967) applied a version of activity sampling using medical students to evaluate the work done by 25 different practitioners in the course of one day. They used watches and made a recording every five minutes of what the doctors were doing at that point in time and this recording was checked at the end of the session by the doctor himself.

Activity sampling technique was used in general practice by Buchan and Richardson, who reported on its use in 1972. They used independent observers to study the content of office work and in 1973 extended this approach to the consulting room.

Activity sampling

Activity sampling first introduced by Tippett (1935) under the name of 'snap reading', is a branch of work study whereby a series of observations is made on an operator at

Date .....
Dr/Nurse ..... Clinic/Surgery
Total patients seen .....

Start .....
Finish .....
Total mins.....
Total bleeps .....
Bleeps in mins. .....
+ unrecorded time .....
Total .....
Missed mins. .....

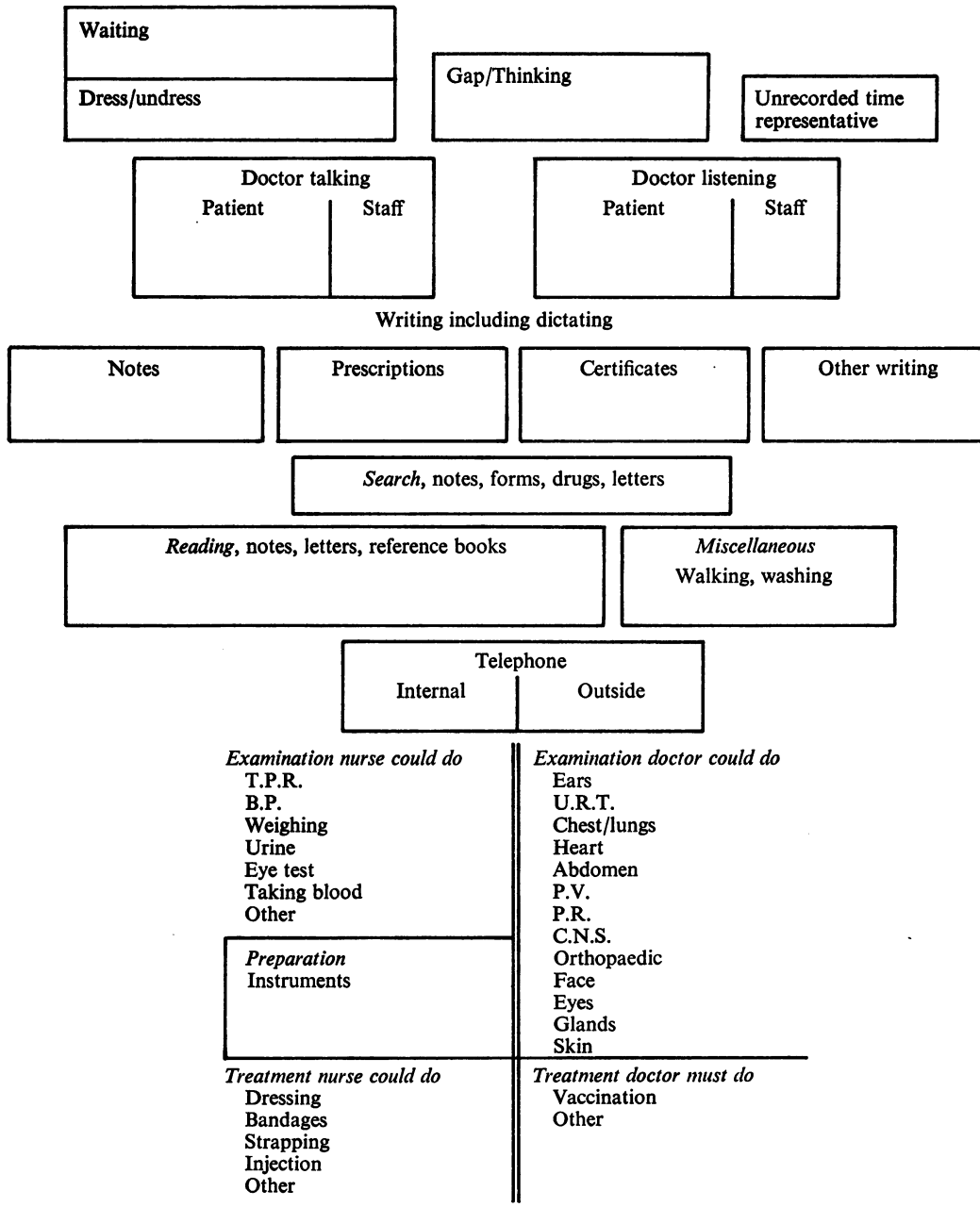

Figure 1
The recording form.

regular or random intervals of time and from which an estimate can be made of the work content of the job he performs. In a factory an observer will walk round and record what the operators are doing as he passes their machines. When a large enough number of observations has been made, calculations can be made of the percentage of time spent on each activity. For example in a series of 2,000 observations, if in 200 of those observations the subject is undertaking a certain activity (e.g. feeding a machine), then it is inferred that ten per cent of time is spent doing that particular activity. Applied to general practice, if a doctor could record his own activities at precise time intervals, he could make similar evaluations of his work content.

Bleep method

The ' bleep method ' is a technique of activity sampling in which the subject measures and records his own activities. We can find no published reports on this method, but have adapted a procedure apparently used first in a marketing organisation, whose observers accompanied representatives to analyse the content of their work (Livesey, 1969). The observer carried a small electronic device rather like a hearing aid with an ear plug attached. This emitted regular signals heard by the observer only, who recorded what the representative was doing at the point when the bleep was heard. It was originally thought this machine would make it possible for a doctor himself to record how he worked. However, the ear piece made it difficult to use a stethoscope.

A transmitter was then constructed to provide a regular signal at half or one minute intervals which, though audible to the patient, was sufficiently unobstrusive not to disturb him. The bleep signal was transmitted through the surgery premises by loud speakers. The apparatus proved reliable in consistency of inter-bleep interval and was otherwise trouble-free and quite cheap to build and install. The appendix gives technical details of the apparatus used.

Before applying the recording technique, a form was devised to standardise and to simplify recording. The different activities (elements) performed by a doctor during surgery consultation, such as writing, listening, talking, and examining were scheduled in detail. These were grouped into 22 distinguishable elements (Table 1) by combining together sets of similar but rare activities. Decisions on these elements took into account the study objectives, for example the category " examination and treatment " was divided into what a nurse could do and what the doctor must do, to establish the potential for re-allocation of duties and time saving.

The standard elements were doctor orientated (e.g. if the doctor was writing while the patient dressed, this would be classified as doctor writing) and all were clearly defined. These elements can be seen set out on the recording form illustrated in figure 1. In use, when the bleep was heard, a dot was placed in the appropriate element square on the form. The doctor was instructed to record immediately the bleep sounded to avoid confusion in trying to remember whether he had recorded or not. If he was performing two activities when the bleep sounded e.g. writing and listening, a dash was placed in the two appropriate squares. In practice such simultaneous recordings were so few that there was no difficulty in reconstructing them if required for subsequent analysis.

Difficulty could occur if the bleep sounded while moving from one activity to the next and for this reason conventions about break points had to be established to maintain consistency in recording. Thus, if the bleep sounded at the moment when one activity had just been completed and there was an intention to move to the next, the next intended activity would be recorded. For example, putting a stethoscope into the ears when the bleep occurred, would be recorded as examining the patient, or picking up a pen would be writing (Bevan and Cunningham, 1975).

In the first application of this method of work-study a half minute recording

TABLE 1

SCHEDULE A—COMPARATIVE FIGURES FOR SEPARATE WEEKS

Doctor	A		B		C		D		E	
	Week 1	Week 2	Week 1	Week 2	Week 1	Week 2	Week 1	Week 2	Week 1	Week 2
Average number patients seen per surgery	27	23	26	26	19	16	19	18	17	16
Average length of surgery	121 mins.	111 mins.	111 mins.	102 mins.	100 mins.	79 mins.	114 mins.	105 mins.	101 mins.	83 mins.
Average time per patient	4·5	4·8	4·2	4·0	5·3	5·0	6·0	5·8	6·0	5·1
Number of surgeries	7	7	9	9	7	8	7	7	9	9
Talking	% 23·0	% 25·3	% 20·1	% 17·7	% 21·3	% 23·1	% 23·0	% 27·2	% 20·3	% 17·0
Listening	27·7	31·0	29·8	27·1	22·7	32·5	20·2	18·0	17·0	18·6
Doctor examining	8·8	6·2	13·4	11·7	5·8	3·8	13·4	15·0	9·8	12·9
Nurse can do treatment and preparing instruments	4·0	3·8	3·2	2·8	4·6	3·5	0·6	0·8	4·6	5·9
Miscellaneous	9·6	8·0	10·4	13·7	14·5	8·9	5·6	6·8	11·0	11·1
Waiting	9·2	7·9	3·2	2·2	6·7	6·9	5·0	4·4	4·7	3·5
Writing	17·7	17·8	19·9	24·8	24·4	21·3	32·2	27·8	32·6	31·0

(Miscellaneous includes—telephone, reading, searching, walking and washing).
(Waiting—between patients and waiting for patients to undress).
Average missed bleeps per doctor was three per cent, not included in above figures.

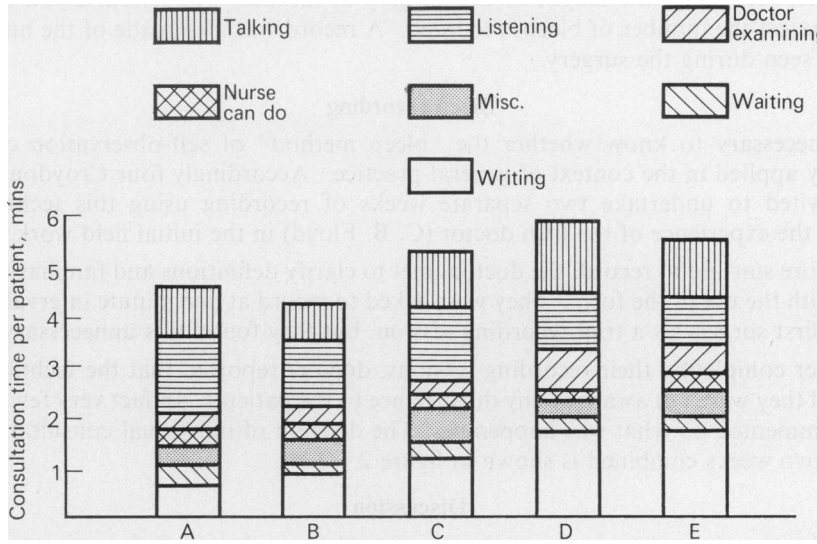

Figure 2
Divison of activities per consultation—both weeks combined

interval was used, as many procedures commonly employed during a surgery take considerably less time than that to perform. It was originally felt that the more frequent the bleeps the greater the accuracy of recording and it has shown to be possible to record at this rate with a high degree of accuracy.

Later work showed that bleeps at one minute intervals gave comparable results and made recording far easier.

TABLE 2
EXPLANATION OF SOME TERMS USED ON BLEEP FORM

Waiting between patients	Waiting for one patient to leave and another to enter surgery.
Gap/thinking	Clear gap between one procedure and the next. *Or* doing nothing but thinking.
Other writing	Hospital letters, writing pathology forms or x-ray forms.
Reading letters	Notes, hospital letters, reference books etc., e.g. *MIMS*.
Search	Notes—looking through notes to see what patient has had etc.
	Forms—looking for a particular form.
	Drugs—looking in drug cupboard for a particular drug.
	Letter—looking through patient's notes for a particular hospital letter.
Walking/washing	Walking in surgery during consultation. Hand-washing.
Dual categories:	
	Doctor talk and write.
	Doctor listen and write.
	Doctor talk and other (" other " includes search or wash etc.)
	Doctor listen and other (" other " includes search or wash etc.)

When recording, the length of the surgery in minutes was noted, as an accuracy check against the number of bleeps recorded. A record was also made of the number of patients seen during the surgery.

Bleep recording

It was necessary to know whether the ' bleep method ' of self-observation could be generally applied in the context of general practice. Accordingly four Croydon doctors were invited to undertake two separate weeks of recording using this technique to confirm the experience of the fifth doctor (C. B. Floyd) in the initial field work.

Before starting to record, the doctors met to clarify definitions and familiarise themselves with the use of the form. They were asked to record at one minute intervals and to use the first surgery as a trial recording session, but they found this unnecessary.

After completing their recording sessions, doctors reported that the technique was easy and they were not aware of any disturbance to the patients. In fact very few patients even commented on what was happening. The division of individual consultation time for the two weeks combined is shown in figure 2.

Discussion

A fair degree of consistency in results was found for a doctor if the estimate of time spent in different activities was based on a whole week's time cycle. Within this, individual surgeries varied in content and the time spent in different activities. The close similarity between the two weeks recorded by each doctor is shown in table 1.

The way a doctor distributes his time in different surgery activities appears to be fairly consistent for him—so that each has his own work ' profile'. The way he distributes his activities must not be taken to be an assessment of the standard of medical care he provides, but knowledge of this distribution, especially when compared with the results of colleagues, may at least raise a number of questions relevant to the most effective use of the time of skilled staff.

If enough studies were made, a bank of ' norms ' could be collected under varying practice conditions to enable individual doctors to examine their own results critically, as in isolation it may be difficult for a doctor to assess his results and determine whether or not the time occupied by a particular activity is excessive.

A doctor, when he sees how he uses his time (by, for example, consulting table 1 and figure 2) may wish to make a conscious effort to listen more, to talk more, or to spend more of his time examining patients to improve his care of them. Excessive time spent waiting for patients may point to a defective call system (or perhaps appointment system). A high proportion of time spent writing may mean that secretarial facilities are inadequate or not being fully used. However, if he spends only a short amount of time writing notes (e.g. ten minutes per surgery), the use of a dictaphone and secretary to type these notes may be wasteful of resources. Much time spent searching may imply that reorganisation of records would be beneficial. A study of the proportion of time spent doing work a nurse could do (e.g. some types of treatment) may indicate whether or not it would be profitable to introduce or reorganise nursing support in the surgery.

Other applications

Although this paper refers to the application of the technique by five doctors in a normal surgery, it has also been used by nurses working in the practice.

In the pilot study, the technique was tried out in several different situations, with a variety of medical and nursing staff recording themselves:

(1) Doctor working with a nurse in a normal surgery,

(2) Doctor working in various clinics, well-baby, varicose veins, antenatal,

(3) Practice nurse working in a normal surgery,

(4) Practice nurse working in various clinics, well-baby, varicose veins, antenatal.

Most staff coped with the bleep technique without difficulty.

Conclusion

In our opinion, the bleep application of activity sampling has proved to be an easy and cheap method of studying work in general practice. The basic analysis of the data arising from this technique can be easily and quickly accomplished providing rapid feedback. Doctors who have undertaken this type of recording have found their results instructive and illuminating, suggesting that if undertaken on a large scale, considerable benefit could be derived for both doctor and patient.

Acknowledgements

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Mr R. J. Ahearne constructed the bleep apparatus and Mrs M. Riches, practice secretary, provided secretarial help in preparing this paper.

Appendix

The bleep apparatus

An electronic ' bleep machine ' was constructed for the experiment using valves and two electromechanical ' timer ' switches, one with a half minute interval and the other with a minute interval. These were supplied by Messrs. Crouzet, England Ltd., at a cost of £2.00 each.

An electronic circuit producing a ' note ' was fed via one of the switches to a second circuit where the signal was amplified and heard as a bleep from a small loud-speaker mounted in the unit. A selector switch enabled the operator to use either a half minute or one minute time interval. It was possible to vary the pitch and volume of the note to suit the operator. A socket was provided on the machine to allow extension speakers to be plugged into the master unit and this enabled signals to be heard elsewhere in the building, e.g. in the examination room. The whole unit measured 27·9 cm × 17·8 cm × 10·2 cm (11″ × 7″ × 4″) deep and looked like a small radio.

References

Bevan, J. & Cunningham, D. (1975). *Self Observation in General Practice. Assessment of Bleep Method of Activity Sampling.* (In press.)

Buchan, I. C., & Richardson, I. M. (1972). *Journal of the Royal College of General Practitioners*, **22**, 331–334.

Buchan, I. C. & Richardson, I. M. (1973). *Time Study of Consultations in General Practice.* Scottish Health Service Studies No. 27. Edinburgh: Scottish Home and Health Department.

Jeans, W. D. (1965). *Journal of the Royal College of General Practitioners*, **9**, 270–279.

Livesey, A. (1969). Personal communication.

Parrish, H. M., Bishop, F. M. & Baker, A. S. (1967). *Archives of Environmental Health*, **14**, 892–898.

Tippett, L. H. C. (1935). *Journal of Textile Institute Transactions*, **26**, 51–70.