

Audiovisual media in medical practice

A pilot experiment

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A LONG-TERM research project has been set up, within a single-handed general practice, in order to study the hypothesis: *An audiovisual instrument can help the medical practitioner to communicate more effectively with his patient, without materially increasing the time expended by the doctor himself.*

In an effort to prove this hypothesis, an experimental service to patients has been provided. In suitable cases, after the normal consultation, the patient is taken into a small comfortable room with a relaxing decor (the Studio) where he can listen to a tape or see a film on the subject of his particular problem.

By this method it is hoped:—

1. To increase the patient's knowledge and understanding of his own particular problem or disease.
2. To improve his attitude to his complaint and its treatment.
3. To increase his ability to carry out that treatment.
4. As a result, to improve his clinical response to treatment.

It was discovered early in the project that it takes at least 15 minutes to advise fully the newly-diagnosed angina case, if this is to be done in a careful and comprehensive fashion. This is in addition to the time which has already been spent on the history, examination, investigation and prescription writing. The advice given to one angina patient is similar to that given to any other. Therefore a large part of this advising could well be done by an audiotape, in a 'Compact Cassette' which is easily replayable through a cassette player.

Audiovisual programmes are *not* intended as a substitute for any part of the normal personal consultation between patient and doctor; their purpose is to support, amplify and improve that consultation. After hearing the tape or seeing the film the patient should always be given an opportunity to discuss it with his doctor and to ask questions. While the tape or film is running the doctor can see other patients.

This report describes a pilot experiment, which was conducted as a preliminary to wider research. The purpose of the experiment was to attempt to confirm the hypothesis: *Exposure of a 'stable' angina patient to an audiotape on angina will significantly increase his knowledge of his complaint, measured one month after the exposure.* The word 'stable' is used to denote the case of established angina who is not deteriorating clinically, whose treatment by drugs has been stabilized and who has already been fully advised by his doctor. Theoretically, he should know all there is to know about the management of his angina.

Producing the audiotape

The audiotape 'Living with Angina' was researched, scripted and recorded exclusively for the individual angina patient of average intelligence, sitting alone in comfortable

surroundings. Its purpose was to inform and advise the patient, to allay his anxiety, and to encourage him to develop an objective attitude towards his complaint. It was made as short and as lucid as possible, consistent with being comprehensive. The proposed contents of the tape were researched by a preliminary survey of the literature. Comprehensive access to the literature was obtained by computer, using U.K. Medical Literature Analysis and Retrieval System (MEDLARS). All stages of the production of this tape were supervised and criticized by a consultant physician. The final audiotape was thought to be as accurate and as comprehensive as could be. In spite of ruthless editing the final tape runs for 18 minutes. Few practitioners have this amount of time available to give to the task of advising the angina patient. Even if they have, it will be difficult for any doctor to maintain a comprehensive and fresh approach to repetitive advising of this sort, particularly if the waiting room is full.

Questionnaire

In order to assess the effect of the tape on the patient, a TRUE/FALSE questionnaire was constructed, with the help of the Department of General Practice, University of Manchester. Three types of questions were included:

1. 50 *Relevant (R) questions*. *I.e.*, questions on angina directly answered by the audiotape.
2. 50 *Semi-relevant (S) questions*. *I.e.*, questions on angina not directly answered by the audiotape but answerable, by common sense or deduction, after listening to the tape.
3. 50 *Non-relevant (N) questions*. *I.e.*, questions on medical or health subjects, but entirely unrelated to angina.

These questions were thoroughly mixed in the questionnaire itself but were analysed separately. The questionnaire was first submitted to 25 first and second year psychology students at U.C.N.W., which resulted in slight improvements to the wording of the questionnaire but basically it went forward unaltered.

Experimental method

All the 'stable' angina patients in the practice were identified and their medical envelopes colour-coded. They were then grouped into matched pairs according to age, sex and general intelligence, as far as that could be assessed. Then they were randomly assigned to two groups:

1. *Questionnaire-Tape-Questionnaire (Q-T-Q) Group*
These patients were taken individually into the Studio and left alone to answer the questionnaire (QA). Exactly four weeks later they listened to the audiotape "Living with Angina", alone in the studio. After a further four weeks they again completed the same questionnaire (QB).
2. *Tape-Questionnaire (T-Q) Group*
With this group the first questionnaire was omitted. The patient listened to the tape in the studio and four weeks later he answered the questionnaire (TQ).

A total of 36 stable angina patients were discovered in a practice of 1,650 patients, an incidence of 1 in 46 (2.2 per cent). (There were no 'unstable' patients, as it turned out). One patient declined to assist. The questionnaire was beyond the capability of a second patient. A third was unable to assist due to intercurrent illness. These three patients together with their 'opposite numbers', were removed from the experiment, leaving two groups of 15 patients each. The average age of these 30 patients was about 71. The oldest was 82 and the youngest was 57.

Results

Table I compares the scores obtained by 25 psychology students with the scores on the first questionnaire completed by the Q-T-Q group of 15 patients. It should be noted that all scores are out of 50. Because the questions are all of the TRUE/FALSE variety, a score of 25 represents chance alone, and a score of 50 represents 'complete knowledge'.

The students did better than the patients in the non-relevant questions and the patients did better in the relevant and semi-relevant questions. However, the patients' mean score in the relevant questions was only 2.5 above that of the students. Certainly the angina patients were not as well informed as had been expected. This is in accord with the view of Ley and Spelman (1967) that patients forget much of what the doctor tells them. The poor state of knowledge of the angina patients might have arisen in one, or both, of two possible ways:

1. As part of a general climate of poor communication between doctors and their patients.
2. Because of an individually poor level of instruction of these particular patients.

TABLE I
MEAN SCORES OUT OF 50 BY 25 PSYCHOLOGY STUDENTS AND 15 ANGINA PATIENTS ON THREE TYPES OF QUESTION

	R	S	N	Total
25 students	35.4	33.3	31.2	99.9
15 patients	37.9	36.1	28.3	102.3

To determine whether patients in this practice had been less well instructed than by the general run of doctors, the patients who had answered the pre-tape questionnaire (QA) were further divided into two groups:

1. Angina patients originally diagnosed and advised here.
2. Angina patients originally diagnosed and advised before they came on this list, by another doctor.

The mean score of the first group on the R questions was 37.9 and that of the second group was 38.3. This difference is small and statistically insignificant, yielding a *t* of only 0.07, so it seems likely that the instruction originally provided for angina patients in this practice is entirely typical.

TABLE II
RELEVANT, SEMI-RELEVANT AND NON-RELEVANT MEAN SCORES BY TWO GROUPS OF 15 PATIENTS.

Q-T-Q Group	QA (1st questionnaire)			T A P E	QB (2nd questionnaire)		
	R	S	N		R	S	N
	37.9	36.1	28.3		40.9	36.2	29.5
T-Q Group	TQ (Tape questionnaire)			T A P E	R	S	N
					40.3	35.3	28.7

Table II shows the mean scores obtained on the three types of question by the two groups of patients. In the Q-T-Q group, an improvement in scores between the first and second questionnaires may be caused by three possible factors:

1. The effect of the tape on the patient.
2. The effect of the first questionnaire on the patient.
3. The effect of the questionnaire/tape interaction on the patient. Interaction arises if patients derive more (or, improbably, less) benefit from the tape as a result of their prior experience of the questionnaire.

The purpose of the T-Q group was to provide a well matched group in which factors 2 and 3 had been eliminated, by omitting the first questionnaire.

Improvements in scores may have occurred due to extrinsic factors, such as a television or radio programme, or a newspaper article, coinciding with the period of the experiment, and an attempt was made to evaluate this possibility. After completing the post-tape questionnaire, each patient was asked if he had had any information from such sources during the previous eight weeks. Only one patient had definitely received information in this way, and one thought he had but was not sure. These patients were in different groups and their scores were not outstanding. It was concluded that such extraneous factors were not likely to have influenced the results to any significant degree.

The difference between QB and TQ is a measure of the combined effects of the first questionnaire and of any interaction, since the absence of prior experience of the questionnaire was the only systematic difference underlying the two sets of scores.

To analyse this, and subsequent, comparisons the raw scores were first subjected to an arcsin transformation. Then Analysis of Variance was applied to the differences between the matched individuals' scores on the two questionnaires. In addition to the F ratio assessing uniformity among the three types of question, it was possible to calculate t 's to see with which, if any, types of question the difference between questionnaires was significantly greater than zero.

In the case of QB and TQ the resulting F and all three t 's were smaller than 1, so there was no indication that either the first questionnaire or the interaction had any influence on performance.

The difference between QB and QA shows the combined effects of all three factors, and it is instructive to examine this joint effect on each of the three types of question in the questionnaire. The tape had no bearing on the non-relevant questions, and these showed no significant improvement ($p > 0.2$) which further supports the view that prior experience of the questionnaire had little or no effect, under the conditions of the present experiment. The difference in the case of the relevant questions was highly significant ($p < 0.002$, implying that there is less than 1 chance in 500 that the observed improvement is attributable to chance alone). Thus the tape was effective in improving the R scores. The improvement in the S scores was smaller even than in the N scores and so can be attributed only to random fluctuations in performance. There is no evidence that the tape had any influence on the success with which these S questions were answered.

The difference between the TQ and the QA questionnaires gives a more rigorous assessment of the effect of the tape alone, since the TQ group had no prior experience of the questionnaire. The improvement in R scores was about the same in TQ as in QB, especially if the small improvement in N scores is taken as the baseline in each case. But the TQ—QA comparison is subject to much greater variability than is the QB—QA comparison, because the same individuals are being compared in the latter case while only matched pairs are compared in the former. Although both give virtually the same estimate of improvement (more than 20 per cent of the total possible improvement) the TQ—QA difference is not significant because of its greater variability.

A second estimate of equal rigor and conservatism is given if the influence of the first questionnaire on the QB results is not considered negligible but instead is estimated by the difference between the R and N questions. This increases the variability of the estimate as well as slightly reducing its size, but when these two very conservative estimates are pooled to give a single t it turns out significant at $p < 0.05$.

In view of the small number of patients available for this experiment the result must be regarded as highly satisfactory.

Discussion

The experiment was designed as conservatively as possible and so for several reasons the results are an estimate of the *minimum* benefit likely to be obtained from this kind of instruction:

1. The patients were established angina cases and had had the standard instruction and advice before the experiment began. Several had had many years' experience of living with angina. Newly diagnosed patients would have greater room for improvement.
2. A fairly long period of four weeks was purposely allowed to elapse between the first questionnaire and the audiotape. This was intended to minimize the effect of the first questionnaire on the second one and on the benefits derived from the tape.
3. Similarly, the second questionnaire was administered four weeks after hearing the tape. Forgetting proceeds rapidly at first and then increasingly slowly, so it may be taken that material retained for four weeks will be more or less permanently retained (Woodworth 1938).
4. This experiment used only an audio approach. It is reasonable to hope for a greater effect, at a later stage, using audiovisual techniques.

In spite of all these moderating factors a worth-while improvement was found in the questions which were answered directly by the tape. The 'semi-relevant' questions, which were answered only indirectly or by inference, showed no improvement. The conclusion is that, for patients of the kind studied here, an audiotape should present all the facts in a straightforward way and not leave anything to be deduced by the patient. But this restriction might not be true of younger or less knowledgeable patients.

Subjective impressions of the experiment

Patients were not asked to comment on the tape itself or on the idea behind it but any spontaneous remarks were recorded. Out of a total of 34 patients who listened to the tape, 22 expressed approval of the service and asked questions about their complaint. A further four just asked questions and eight made no comment. There were no unfavourable comments.

The spontaneous remarks of one particular patient coincided so closely with our own feelings about the possible value of audiovisual media in medical practice that we make no excuse for quoting it verbatim: 'When I am sitting with you I am under some degree of tension, but when I go in there (the Studio) and listen, then I can listen calmly and objectively and what I am listening to carries weight and makes a lasting impression and I can remember it afterwards'.

Several angina patients had varying degrees of deafness and two wore hearing aids. On questioning, they did not admit to any difficulty in hearing the tape clearly under the acoustic conditions prevailing in the Studio, if the sound volume was turned up slightly.

Although the availability of the audiotape was advertised in the waiting room, only one patient actually *asked* to hear it. This seems to confirm a widely held view that the waiting room notice board is virtually useless. Perhaps patients are generally too tense, whilst waiting their turn, to absorb much information from their surroundings. This may well also be true whilst the patient is sitting opposite his doctor. Ley and Spelman (1967) have found that patients with a high anxiety level recall less of what they are told than those with an average anxiety level. It is possible that, after the consultation is over and the patient is out of the doctor's presence, he may become less anxious and more receptive to advice and information. The communication of ideas by an instrument may have an advantage in that the patient does not have to respond or 'put on a face', and can therefore relax and listen more easily, knowing he is not being watched.

It was noticeable that, immediately after hearing the tape, most patients showed a more animated interest in their complaint. They asked pointed and relevant questions with a degree of enthusiasm not often encountered during normal face-to-face consulta-

tions. Questions on smoking and weight reduction seemed particularly common, again an unusual experience.

Summary

The 36 stable angina patients in one practice were identified, divided into two groups, and exposed to an 18 minute audiotape entitled 'Living with Angina'. An attempt was made to measure the permanent effect of this audiotape on the patient's knowledge of his own complaint, as measured by a questionnaire.

The audiotape was effective in improving patients' scores by about 20 per cent of the total possible improvement. At the most conservative estimate, there was a less than 1 in 20 probability that this improvement had occurred by chance. The results suggest that audiovisual programmes should present all the facts in a straightforward way, and not leave anything to deduction by the patient.

Much further research, into the possible value of different types of audiovisual media in medical practice, is needed before firm conclusions can be drawn. This pilot experiment encourages the view that time and money spent on such research will produce useful results.

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Flavour and the part it plays in our food

Again, we often pre-judge our food by its appearance and, in particular, by its colour. There are few of us who would eat an ice-cream, a jelly or a boiled sweet if it were not coloured as we would expect it to be. One would tend to reject instantly a blue-coloured 'strawberry' jelly or a yellow-coloured 'blackcurrant' pastille. Why is this so? Not because the product tastes wrong. It may be perfectly good strawberry or an equally authentic blackcurrant but, just because these colours give the wrong flavour association, we do not like them.

Having said this, we can see that taste and smell are integrated with the senses of touch, hearing and sight, as well as the sensation such as pain, particularly in the case of highly pungent foods, so that the whole complex enters into our appreciative faculties. We cannot really treat any one of these senses in isolation at all. The body responds as a whole to stimulus and not to separate packets. For this reason, many apparently unrelated external factors, as well as the more obvious direct ones, can and do modify our reaction—particularly in the realm of food and drink.

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