IMPLEMENTING MONITORING SYSTEMS FOR OUT-PATIENT CLINICS - THE CONTRIBUTION FROM IT

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Introduction

In NHS hospitals, there are approximately 40 million outpatient attendances each year at a cost of some £1.2 billion (National Audit Office) **[1].** There appear to be two prime sources of public concern in this area. On the one hand is the 'waiting time' between referral by a GP and eventual attendance at an outpatient clinic - this time is generally measured in weeks. On the other hand, there is the time that patients spend in outpatient clinics and this is conventionally measured as the time (in minutes) between the allocated appointment time and the time that a consultation commences typically with a member of the clinical staff. This paper will concern itself with 'waiting times in clinics' which is the subject of a *The Patient's Charter* **[2]** standard i.e.

> *"you will be given a specific appointment time and*
>
> *and be seen within 30 minutes of that time"*

The necessity to monitor outpatient waiting times

Studies have consistently revealed that the amount of time spent waiting in outpatient clinics has often been a source of

dissatisfaction. For example, Cartwright and Windsor **[3]** report some 55% of patients having to wait for 30 minutes or more whilst a study by Dash **[4]** found patients waiting for an average of 1.8 hours in one District General Hospital. It is not surprising, therefore, that *The Patient's Charter* addressed this issue directly with the '30 minute' standard (possibly seen to be reformulated as a '15 minute' standard) as it is possible to effect quite dramatic improvements by better clinic organisation.

Better clinic organisation, however, needs more systematic data upon which to be based. Evidently, it is necessary to have a systematic recording basis for both patient arrivals, patient appointment times and the lengths of their consultations. Furthermore, as we shall see, it may be necessary to collect other kinds of data as well e.g. whether the patients come to a clinic using their own transport or are brought by the ambulance service over which they have little control.

A case study - Leicester General Hospital

Leicester General Hospital is a medium to large size teaching hospital located some four miles from the centre of Leicester. It is one of three major acute provider units which collectively serve a population of a million people and provides some 100,000 episodes of outpatient care each year.

In Autumn of 1991, Leicester General together with the assistance of the author instigated a pilot study in order to assess a baseline of waiting times in a variety of clinics before initiating a quality improvement programme to meet *The Patient's Charter* standards.

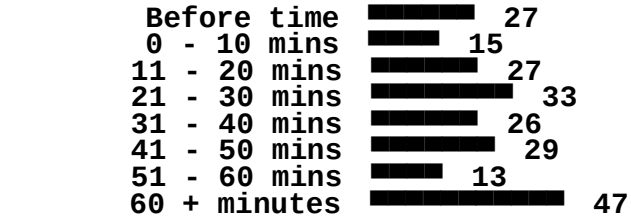
The results of the initial monitoring are shown in Table 1 below:

Table 1 : Waiting times in Clinics- Leicester General (1991)

Waiting Time Pilot Study [December, 1991]

Value Label	Frequency	Percent	Cum. Percent
Before time	27	12.3	12.3
0 - 10 mins	18	8.2	20.5
11 - 20 mins	27	12.3	32.7
21 - 30 mins	33	15.0	47.7
31 - 40 mins	26	11.8	59.5
41 - 50 mins	29	13.2	72.7
51 - 60 mins	13	5.9	78.6
60 + minutes	47	21.4	100.0
TOTAL	220	100.0	100.0

WAIT_ Waiting Time - 10 minute blocks



Valid Cases 220

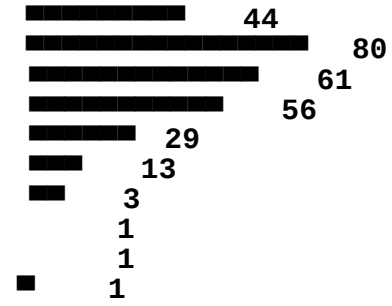
After the quality improvement programme had been put into effect, the following results were achieved within a period of twelve months. Such improvements appear to have been paralleled in other District Hospitals throughout the country.

Table 2 : Waiting times in Clinics- Leicester General (1993)

Waiting Time - Sample of 31 clinics [March 1993]

Value Label	Frequency	Percent	Cum. Percent
Before time	44	15.1	15.1
0 - 10 mins	80	27.5	42.6
11 - 20 mins	61	21.0	63.6
21 - 30 mins	56	19.2	82.8
31 - 40 mins	29	10.0	92.8
41 - 50 mins	13	4.5	97.6
51 - 60 mins	3	1.0	97.3
61 - 70 mins	1	0.3	98.3
71 - 80 mins	1	0.3	99.0
80 + mins	3	1.0	100.0
TOTAL	636	100.0	100.0

WAIT_ Waiting Time - 10 minute blocks



Valid Cases 291

As can be seen, the critical figure to observe is the proportion of patients seen within 30 minutes. From a baseline of 47.4%, this had been improved to 82.8%. The improvements were due to two factors:

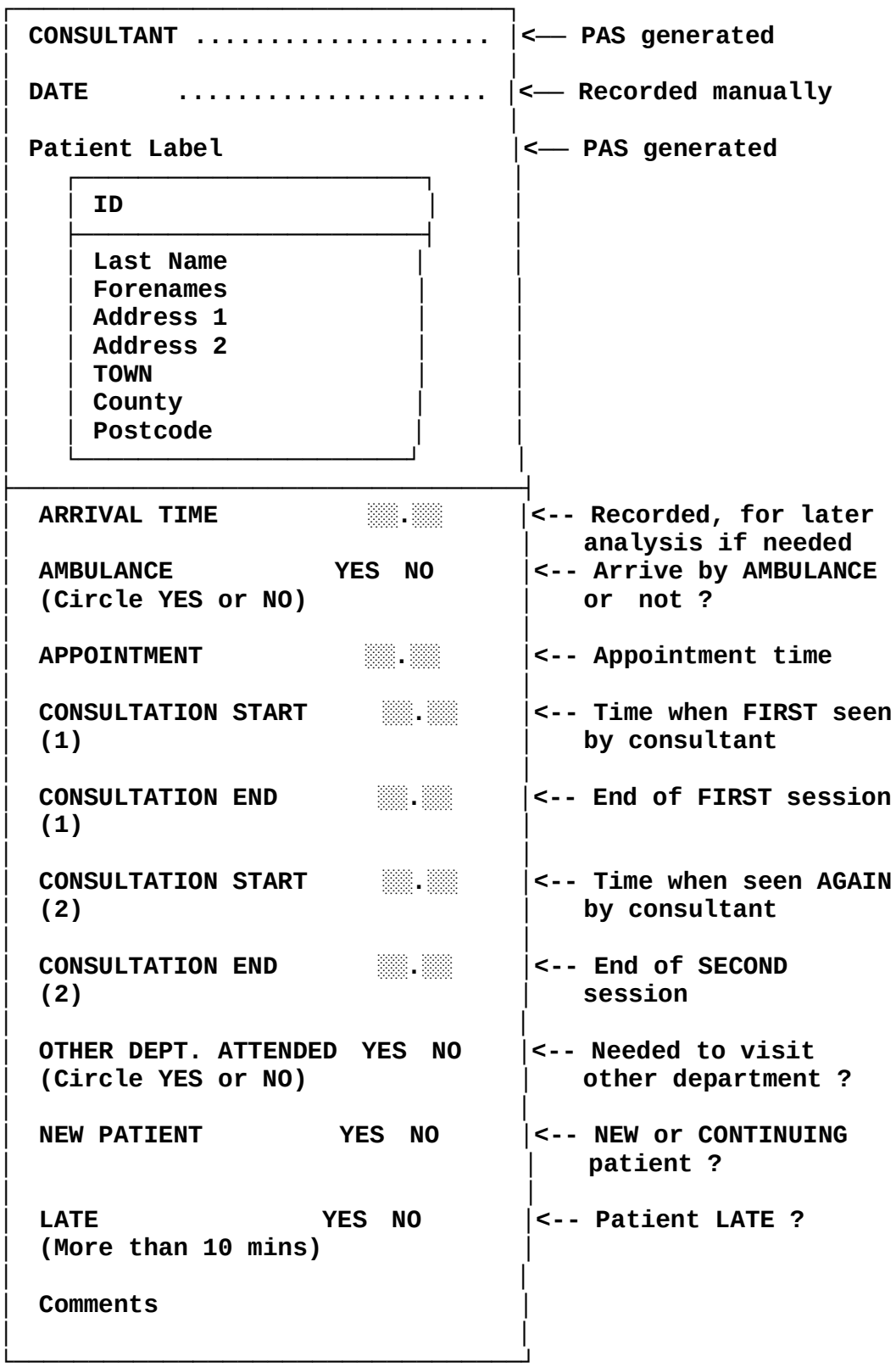
(i) A recording and measurement system which recorded basic data on every patient attending a sampled clinic. Clinics were sampled on a rolling basis to ensure that every clinic was eventually sampled at some time or other. This also allowed comparisons to be made over time for individual clinics.

(ii) An enlightened and sensitive approach to the data by local management to secure the co-operation of all of the clinic staff and consultants in the quality improvement programme.

Requirements of an Information System

What is the ‘Minimum data set’ that needs to be collected from the sample of patients selected? This is perhaps best illustrated by reproducing the Patient Record Card developed at Leicester General Hospital:

Table 3 : Sample Patient Record Card



We should note the following :

Time-based data (arrival time, appointment time, consultation start and end for up to 2 episodes)

This is evidently necessary to calculate the raw ‘waiting times’ - in particular, that between appointment time and first consultation start.

Logical data (New/Continuing patient, Late/On time, Other depts/No other depts, Ambulance/Own transport)

Experience suggests that each of these categories has an important impact upon the ‘raw’ data:

- New patients typically take more consultation time than continuing patients
- If patients are ‘late’ and have missed their appointment slot, should they then still be included in the waiting-time statistics ?
- Do patients need to visit another department (e.g. for a blood-test) - if so, should this be recorded as the start of the ‘consultation period’

- Did patients arrive by ambulance (much earlier/later than the clinic time?) or arrive independently ?

Clinic data (Consultant, date and time of clinic)

Patient data (PAS number, name & address)

How is the information to be used ?

Any recording system should be able to record the frequency and the cumulative frequency distributions as well as statistical data such as the mean, the median and the standard deviation. Medians (value attaching to the 'middle' position of an ordered list) are much more useful than means which may be adversely affected by one or two extreme values. Medians are *much* more difficult to program than averages, as they require a sort of the data and perhaps an interpolation.

It is important that data should be easy to assimilate. Although the data needs to be computed as a continuous variable (in minutes), it is often advisable for presentational purposes to divide the data into 10 minute (or 5 minute) blocks making it easier to visualise. Were the Charter standards to change, it would be much more difficult to adapt the software if the data

had been recorded as a categorical variable (e.g. 10 minutes blocks) rather than a continuuos variable.

Consultants need to feel a sense of ‘ownership’ of the data. The recording of consultation time starts and lengths may well be seen as a threat to their autonomy. Statistical reports need to be discussed with them so that a collective solution may be found to improving the overall quality of care in an outpatient episode. As Ross **[5]** observes :

“the key seemed to be to gain clinicians’

understanding and acceptance through presentation

of accurate and relevant data”

The contribution of an IT department

An IT department can be responsible for installing and maintaining a monitoring system but its responsibilities lie beyond merely ensuring a minimum data set. There are two general approaches which may be adopted:

(i) the **‘high-tech’** approach, in which the data logging is probably attached as a module to the PAS and reports are produced centrally. Great care has to be taken, though, that the reports generated are of adequate quality in terms of both the statistics offered and their presentation. Expensive modules may be bought in which cannot calculate a median, or for the purposes of more refined analysis exclude, for example, those patients who had arrived late (and to whom the Charter Standards probably do not apply)

(ii) the **‘low-tech** approach’. The data recording and logging may be done manually or electronically but results can be processed locally on any stand-alone IBM-PC. [This was the approach adopted at Leicester where the data was recorded manually and the statistical analysis conducted by a stand-alone dBASE program - **MOPAL**, *Monitoring of Outpatient Activity in Leicester.* (See also Hart **[6]**)

Whichever approach is adopted, the first requirement is the production of high quality data. If a data logging approach is

taken, this requires investment in appropriate data capture instruments (e.g. wands, bar code readers). Were data to be entered manually into a computer system, then it would probably require verification by being entered twice and the two resultant files checked to see that they are identical by using a checksum. Given the sensitive nature of the monitoring system, then consultants may well argue GIGO (Garbage In,Garbage Out) if data collection and verification is not of the highest order.

The IT department will also need to lend some statistical expertise in the design of the sampling frame for the clinics to be selected, over the deployment of suitable statistical measures and over careful presentation of the results.

A variety of reports will probably need to be prepared giving data such as:

- ‘raw’ waiting times (preferably in cumulative frequencies)
- Adjusted waiting times (excluding those who arrive late, or perhaps needed to visit other depts)
- Measuring the waiting times for particular sub-samples e.g. do ambulance patients exhibit markedly different patterns from other outpatients ?

How is the monitoring to be interpreted ?

It is hardly ever the case that data, and particularly statistical data, ‘speaks for itself’. One has to be aware of the crudity of a single quantitative measure as an indicator that the quality of the service is improving. Indeed, evidence was given to a House of Commons Select Committee that outpatient waiting times data might be a poor overall indicator of quality because patients might be seen quickly but not get

the quality of attention that they deserve when consultants are put under time pressure. (Bailey **[7]**)

The basic statistical monitoring needs to be complemented by more qualitative measures of service including careful use of patient satisfaction questionnaires. The IT department should be able to bring statistical andpresentational expertise to bear as well. Low cost survey analysis packages are now available, including one recently written by one of the authors (Hart **[8]**).

It is important to stress that organisational and cultural change is not best effected by collecting data, however well, and then ‘beating people over the head with it!’. The reports obtained have to be carefully analysed for any lessons to be learnt. For example, the Leicester example indicates that for some clinics, new patients would need to have a consultation period of an hour, whilst for continuing patients the time may only need to be 15-20 minutes. By recording the modes of transport used, there may be other ‘log-jams’ identifiable in the system such as the adequacy of car-parking and sigposting arrangements or the punctuality of the ambulance service. So whilst good data collection and analysis are essential for good monitoring systems, they only provide the starting point for more detailed analysis. Improvements are best effected by

management, consultants and data analysts forming an effective partnership with each other.

References

[1] National Audit Office. NHS Outpatient Services. London:HMSO,1991

[2] Department of Health. The Patient's Charter. London:HMSO,1991

[3] Cartwright,A. and Windsor,J. Outpatients and their Doctors,London:HMSO,1992

[4] Dash,P. Playing the Waiting Game. Health Service Journal 1991;(22 Aug):16-17.

[5] Ross,H. A farewell to queues. Health Service Journal 1989;(13 July):851-852

[6] Hart,M.C. Low Technology. British Journal of Healthcare Computing. 1992;9(8) (October):19-22.

[7] Bayley,H. Charter Challenge. Health Service Journal.

1994; 1 September:22-23

[8] Hart,M.C. Survey Design and Analysis using TURBOSTATS. London:Chapman and Hall, 1993.