

# Use, and abuse, of the telephone in clinical laboratories: a simple solution

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*... the black leech  
Of the telephone bleeds us white, ...*  
Louis MacNeice (1966)

The telephone dominates the operation of the reporting area in clinical laboratories. Not only is the normal work pattern disrupted by staff continually having to answer the telephone but the efficiency with which these staff function can be seriously compromised. It is significant that even a highly organised, totally integrated, clinical laboratory in the United States can suffer from this problem (Elevitch, 1972).

In the Department of Clinical Biochemistry at University Hospital, we have devised a system of dealing with the abuse (and use) of the telephone which has considerably improved our operating efficiency. Before describing this system, it is necessary to outline briefly our laboratory organisation as it differs slightly from the more conventional system in use in the United Kingdom and in North America.

The Department of Clinical Biochemistry does 1.4 million tests annually (or about 4 million units defined by Statistics Canada, 1976) and is staffed, by shifts, 24 hours each day except for overnight on Saturdays, Sundays, and statutory holidays when the workload is only sufficient to require an 'on-call' cover. Each main division of the laboratory (automated analyses, microchemistry, enzymology, and endocrinology) operates as a self-contained unit with six or less technologists under the direction of a highly experienced charge technologist. These units receive specimens ready for analysis from our specimen preparation room, and then analyse and report the results independently of the other units within the department.

The results were manually collated, in the reporting office, by a departmental secretary, using a cumulative master card system (ie, separate cards for automated analyses, urine chemistry, enzymology, toxicology and trace metals, endocrinology)

with subsequent Xeroxing. As the preparation and issuing of the master cards took a considerable amount of time, the clinical units usually telephoned the relevant analytical division of the laboratory for the results. Although we have recently changed to a computer reporting system this custom continues as it is the quickest way to obtain a result.

## The problem

As the analytical laboratories are staffed only by technologists, there are regular interruptions of the analytical work to answer the telephone. This problem was particularly acute in the automated analyses area where the volume of work is high. We can issue up to 200 separate analyses from our 13 channels on two SMA systems daily. A recent census indicated that this area telephoned 43% of all its issued reports, and that over 25% of all work received was of the 'ahead-of-routine' nature (ie, priority tests). It can, therefore, be appreciated that the telephoning activity in this single laboratory forms a considerable proportion of each technologist's work-day.

## The solution

In the automated analysis laboratory, we introduced changes as follows:

### 1. THE TELEPHONE (Fig. 1)

#### (a) Digital dialling

#### (b) A 'handsfree' telephone unit

We use a Northern Electric Companion 2 Handsfree Unit that allows operation of the telephone without lifting the telephone handset. Thus, to dial a number, press the on key of the unit and, when the dialling code is heard, dial the number. To receive a call, merely press the on key. Calls are terminated by pressing the off key. A mute key on the unit allows 'off-line' conversations in the laboratory which cannot be heard by the caller. The user merely speaks



Fig. 1 The telephone system showing (from left to right) the handsfree unit, the telephone recording and announcing device, and the digital dial telephone.

into the unit at normal voice level about an arm's length away. The loudness of the conversation can be controlled by a loudspeaker volume control.

*(c) Telephone recording and announcing message system*

We use a Dictaphone Model 610 System but there are many equivalent products on the market in both Europe and North America. This device automatically answers the telephone, when the laboratory is staffed but busy, with the following pre-recorded message:

This is the Automated Division of the Clinical Biochemistry Department. We are now responding to your request for information through a telephone answering device. At the sound of the tone, please leave your name, telephone number, and the present time together with the patient's name, results required, and the date of the request. Your call will be returned shortly.

When the laboratory is not staffed, the pre-recorded message (contained on another cassette) is changed to:

This is the Biochemistry Department and you are listening to a recorded message. The laboratory is currently unstaffed. If you require priority test work done, please contact the 'on-call' technologist through the hospital telephone exchange. If your request does not fall into this category, please leave a message at the sound of the tone and your call will be returned after 0700 hours.

The in-coming message is then recorded on a tape cassette which is indexed by a 3-digit counter so that no message can subsequently be lost. The device has an automatic controllable volume monitor which allows the technologists to listen to all in-coming

calls, while continuing to work, so that 'distress calls' can be answered immediately, whereas the majority of calls can be allowed to wait until a more suitable moment.

**2. LOG BOOKS**

McGowan (1974) suggested that the act of telephoning a report should be recorded together with the time of doing so. In Fig. 2a is shown the form that we use to record these facts. In addition, we record the time of both specimen receipt (specimens are time-stamped in) and telephoning the result. This, together with the name of the person taking our results, ensures that there will be no subsequent recriminations about a result 'not having been received' by the clinical unit.

When we receive a recorded message, we log in (Fig. 2b) the tape footage, the time when the message was recorded, and the time when the enquiry was answered by the duty technologist. This log ensures that no messages are missed as the tape indexing runs sequentially.

**The clinical unit**

Each clinical unit has a communication centre staffed by a clerk. Beside each telephone is a yellow-coloured Telephoned Laboratory Report form (Fig. 3). These forms are derived from Dr. J. L. Whitby's (Chief of Microbiology, University Hospital) attempts to surmount the problems encountered when telephoning bacterial antibiotic sensitivities to clerks unfamiliar with the names of the antibiotics used. The other laboratory services added the main 'ahead-of-routine' and some other regularly telephoned tests to this form, thus eliminating the need

**a**

DATE	PATIENT NAME	FLR.	RESULTS PHONED AND PERSON TAKING THEM	TIME IN	TIME OUT	Priority	ICU	Phone Request	Other	TECHNOLOGIST

**b**

DATE	TAPE FOOTAGE	PATIENT NAME	FLR.	RESULTS PHONED AND PERSON TAKING THEM	TIME IN	TIME OUT	Priority	ICU	Phone Request	Other	TECHNOLOGIST

Fig. 2 The log books: (a) the telephoned report work sheet, and (b) the recorded message work sheet.

for the ward clerk to transcribe both the test name and test units with the actual numerical result. This form allows greater speed in transmitting results by telephone.

### Discussion

Is this solution effective? Since introducing the answering and recording device, the number of telephone requests received by the automated analysis laboratory has been reduced by about 60%. Clearly, the system has acted as a deterrent because we can receive up to 20 calls each day where the person telephoning listens to the recorded message and then terminates the call without leaving a message. Sometimes, of course, callers express themselves in brief expletive fashion before hanging up! We can only assume that these calls are of the nuisance or trivial variety. Certainly, we now receive only one call per enquiry whereas before we could often receive two or more calls about the same results.

The great advantage of the recording device is the 'batching' of a number of enquiries, thus using a single pause in the analytical work to respond to several enquiries. The technologists are, therefore, allowed more control over their work patterns.

The problem of the unanswered telephone has also been solved. This must reassure callers when a response is always received. Hospital staff do not

always know when a laboratory is staffed and we are now always able to inform them by means of the answering device.

The inconveniences of using the telephone have been considerably eased by the digital dial and hands-free units. It takes up to 10 s to dial a 4-digit number. A digital ('touch-tone') dial reduces 'dialling' time to about 3 s, and the incidence of dialling errors is considerably reduced. The lifting and laying of the handset while log-books are consulted or the CRT keyboard is operated is avoided. Thus, the whole process of communicating by telephone has been facilitated.

The laboratory log-book system, while consuming technologist time, allows us to monitor our response times to priority tests requests, etc., and has proved to be invaluable in sorting out the common problem, 'We sent you a STAT specimen at 0700 h and we still haven't got the result'. The effort of keeping the log-books has been repaid by the virtual absence of this type of complaint. At the same time we can quickly discover evidence of our internal inadequacies and institute corrective action.

The Telephoned Laboratory Report form has proved to be very useful, although it has not been universally adopted throughout the hospital. It appears that pieces of paper with an undocumented result on it are still preferred by some! Presumably, acceptance of the form will be gradual. Clearly, from


 University Hospital <b>TELEPHONED LABORATORY REPORT</b>		NAME OF PATIENT: _____ CHART NO. _____ ROOM NO. _____ RECEIVED BY: _____ DATE: _____ HOUR: DAY: MO: YR:																																																									
<table border="1"> <tr> <th colspan="2">BIOCHEMISTRY (Blood)</th> <th colspan="2">BIOCHEMISTRY (Urinalysis)</th> </tr> <tr> <td>GLUCOSE mg/dl</td> <td>OSMOLALITY mOsm/kg</td> <td>COLOUR</td> <td>WBC</td> </tr> <tr> <td>BUN mg/dl</td> <td>ASP. T. (OT) U/L</td> <td>CLARITY</td> <td>RBC</td> </tr> <tr> <td>T CO<sub>2</sub> mEq/L</td> <td>ALA. T. (PT) U/L</td> <td>PH</td> <td>CASTS</td> </tr> <tr> <td>CHLORIDE mEq/L</td> <td>LDH U/L</td> <td>PROTEIN</td> <td>CELLS</td> </tr> <tr> <td>POTASSIUM mEq/L</td> <td>ALK. PHOS. U/L</td> <td>GLUCOSE</td> <td>ANOMPHOUS</td> </tr> <tr> <td>SODIUM mEq/L</td> <td>CPK U/L</td> <td>KETONE</td> <td>CRYSTAL</td> </tr> <tr> <td>TOTAL BILIRUBIN mg/dl</td> <td>AMYLASE U/L</td> <td>BLOOD</td> <td>OTHERS</td> </tr> <tr> <td>CREATININE mg/dl</td> <td>BARBITURATE mg/L</td> <td></td> <td></td> </tr> <tr> <td>URIC ACID mg/dl</td> <td>SALICYLATE mg/L</td> <td></td> <td></td> </tr> <tr> <td>PHOSPHORUS mg/dl</td> <td>DILANTIN mg/dl</td> <td></td> <td></td> </tr> <tr> <td>CALCIUM mg/dl</td> <td>MAGNESIUM mg/dl</td> <td>SODIUM mEq/L</td> <td>OSMOLALITY mOsm/kg</td> </tr> <tr> <td>ALBUMIN g/dl</td> <td></td> <td>POTASSIUM mEq/L</td> <td>AMYLASE U/L</td> </tr> <tr> <td>TOTAL PROTEIN g/dl</td> <td></td> <td></td> <td></td> </tr> </table>				BIOCHEMISTRY (Blood)		BIOCHEMISTRY (Urinalysis)		GLUCOSE mg/dl	OSMOLALITY mOsm/kg	COLOUR	WBC	BUN mg/dl	ASP. T. (OT) U/L	CLARITY	RBC	T CO <sub>2</sub> mEq/L	ALA. T. (PT) U/L	PH	CASTS	CHLORIDE mEq/L	LDH U/L	PROTEIN	CELLS	POTASSIUM mEq/L	ALK. PHOS. U/L	GLUCOSE	ANOMPHOUS	SODIUM mEq/L	CPK U/L	KETONE	CRYSTAL	TOTAL BILIRUBIN mg/dl	AMYLASE U/L	BLOOD	OTHERS	CREATININE mg/dl	BARBITURATE mg/L			URIC ACID mg/dl	SALICYLATE mg/L			PHOSPHORUS mg/dl	DILANTIN mg/dl			CALCIUM mg/dl	MAGNESIUM mg/dl	SODIUM mEq/L	OSMOLALITY mOsm/kg	ALBUMIN g/dl		POTASSIUM mEq/L	AMYLASE U/L	TOTAL PROTEIN g/dl			
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Fig. 3 The Telephoned Laboratory Report form (8 x 11 in). This form is placed in the patient's case notes until the laboratory report is delivered.

the point of view of both convenience and general accountability, the form is ideal.

Communication between laboratory and clinical unit is a perennial problem. Ultimately, the availability of remote terminals throughout a hospital (Grams and Pastor, 1976) for direct enquiry on the status of any particular specimen will diminish the use of the telephone, but such a solution is probably too expensive for most institutions. Alternatives include the transmission of results by facsimile telegraphy (Robinson, 1971) or by teletype link to acute care units. However, at a time when the amount of data generated by a laboratory can degrade the importance of the discretionary test result, we are attempting to maintain an efficient but inexpensive link with clinical units which cannot be used for bulk transmission of screening test results.

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