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Short Communication

Experience of delivering laboratory reports as short message service to patients: A one-year experience

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ABSTRACT

Background: One of the common problems faced by patients in any government hospital is the fact that they do not get the results of the laboratory investigation ordered on them at the proper time. While the issues of quality control in laboratory have been adequately addressed by most of the hospital laboratories, the practice of issuing results to the patient in most hospitals is manual and this adds the element of human errors involved in retrieval and issue of the results to them. Hence an attempt was made to send the laboratory results as short message service (SMS) to the patients.

Methods: The project was started for haematology and biochemistry reports as they comprised most of the bulk of investigation ordered on patients. In-house modules were developed using MS Access for the data-entry of the haematology and biochemistry results. The results were then mapped to the patients' name and telephone. Services of an SMS gateway firm were used to then send the results to the patient in the form of SMS.

Results: On an average 150 haematology and 250 biochemistry results are being sent daily to different patients. The cost of sending one SMS is approximately Rs. 0.10. This has resulted in a significant improvement of clientele satisfaction.

Conclusion: Sending laboratory reports as SMS to patients is an easy, efficient and economical way to reach out to the clientele and improve their satisfaction. The method can easily be duplicated in other hospitals also.

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Introduction

Laboratory reports form a very important backbone on which the management of most of the patients is based.

With improved diagnostic facilities, it is possible to tailor-make individual specific treatment. There has been a progressive increase in reliance on laboratory diagnostic services as reflected by the steady increase in the number of tests being done in all laboratories. Automation in the field

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of laboratories has made it possible to cope up with the ever increasing demand of laboratory tests. However, even today the most common problem that all hospitals are facing is the delivery of the reports. While the turn-around time of performing the tests is very less, it is a big challenge to deliver the report to the patient as soon as the result gets validated. As a common measure, OPD patients are advised to report to the hospital the next day/during the next visit to the clinician to collect their report. Reports of hospitalised patients are delivered to the ward the same evening. This process is usually manual in nature. At times, due to lack of manpower to transport reports to the ward, many of the reports remain uncollected for long period of times. A report not available to the clinician at the time he wants it, is a wasted report. It is a waste of money, energy and effort on all the echelons involved from the ordering of the test to the delivery of result to the concerned specialist.

Electronic laboratory reporting (ELR), a system where laboratory reports were being sent on digital format to health authorities, has been in vogue for over a decade.[1,2] In its initial form, the ELR was used predominantly as a tool for surveillance of notifiable diseases. Reports generated from the laboratory were sent to the health care administrators and the inputs from them were used to detect outbreaks early and plan preventive measures. CDC Atlanta, the apex organisation in disease surveillance issued guidelines on how to judiciously use the digital media.[3]

As an advancement to this, efforts were made to send reports of critical value to the ordering clinician, either by way of short message service (SMS) or paging.[4] The aim of this was to provide actionable report to the clinicians and aid treatment of patients. The reports generated were sent to the clinicians, who formulated the treatment plan, and the patients or her/his relatives were not in picture of the results. The system had its advantage in patient management; however, its use was restricted to only critical cases/reports, and most of the time the patients/clientele were not aware of the results.

In the OPD setting of any hospital, sending of actionable reports alone was not meeting the needs of the clientele. The need of the hour is to provide all the report to the patient, preferably as soon as it got generated, so as to let them know their values, and also prevent them from the ordeal of standing in lines and searching their results. In a busy hospital, where the number of samples being tested is very high, manual sorting and distributing of results are a painful, labour intensive process and invariably there is verbal altercation between the report distributing agency and the patient, when a particular report is not found.

Inspired by the fact that one gets an SMS from the bank as soon as money is transacted from the ATM, it was proposed to send laboratory reports to patients on SMS. After studying the setup of how the SMS in the banking sector works,[5] a module was developed to send laboratory reports to the patient in the form of SMS. The present article deliberates the steps taken in achieving this and the impact it has had on the quality of patient care and the challenges therein.

The process of generating SMS reports

The most commonly asked investigation in clinical practice includes the complete blood count (CBC) and clinical biochemistry investigations. These two investigations together comprise nearly 80% of the workload of a clinical laboratory. Hence it was first proposed to send these reports to patient as SMS and evaluate both the feasibility of sending the SMS and impact it had on the clientele. After the initial evaluation of the impact of SMS of haematology and biochemistry reports, it was proposed to expand the scope to other laboratory investigations also after making the due amendments if required.

Automation of biochemistry and haematology reports

For sending the reports to patient as SMS it was essential that all the reports of biochemistry as well as haematology be computerised. This was achieved by developing in-house modules in MS Access. The data from the biochemistry analyzer – Transasia EM 360 was directly acquired from the machines database to the host computer. The data for haematology however needed to be entered manually by a data entry operator. Most of the reports of haematology were numerical in nature and hence the data entry time was not too much, although it warranted a full time data-entry operator.

Mapping the patient report with her/his telephone number

One of the biggest challenges in sending SMS reports was to map the patient's telephone number to the report of the patient. All patients reporting to the OPD were given a unique serial number. It was a number made in two parts; the first part had the date in figures, and the next consisted of the serial number of the patients registering for that day. Together, it formed a unique Visit ID (Primary Key – a jargon used in computer language meant to uniquely identify a record). The Visit ID was used to map the patient's name and telephone number with the haematology and biochemistry report (Foreign Key – a jargon used in computer language that links the primary key of one table to a similar value on other tables).

The database structure

The database structure for sending SMS was simple and consisted of three tables. The first table contained the Visit ID of the patient, her/his name and the telephone number. The second table consisted of the haematology report, which included the Visit ID and all the haematology reports of that patient (which were manually entered). The third table consisted of the biochemistry report, which also consisted of the Visit ID along with a string that consisted of all the biochemistry results generated directly from the machine. The common link between all the three tables was the Visit ID. Each record of the haematology and biochemistry table had a separate field that tracked, whether the SMS was sent or not. The default value for this field was set to 'No'. After the SMS was sent, this field was automatically changed to 'Yes', thus ensuring that the SMS was not sent for another time.