

BEST PRACTICES AT MGIMS SEVAGRAM

HOSPITAL INFORMATION SYSTEM (HIS)

OBJECTIVES OF THE PRACTICE

Hospitals handle a lot of data. This includes patient related data, administrative, financial and personnel related data. Hospital information systems help in developing more efficient systems for data storage, organization and retrieval.

THE CONTEXT

Mahatma Gandhi Institute of Medical Sciences is a tertiary care hospital located in rural Central India. Each year around 700,000 outpatients and 50,000 inpatients—three-fourths of them from underprivileged backgrounds and poor literacy—seek highly subsidized healthcare from the hospital. The paper-based system that the hospital used was full of problems: long queues at the registration counters; multiple forms to be filled for each patient by tormented interns; nurses and pharmacists struggling to read poorly written doctors' notes and prescriptions; and discharge summaries that were illegible, inaccurate or incomplete. Because patients either misplaced their health records or would forget to bring them to the hospital, it was difficult for doctors to gauge their past illnesses. These often generated repeat tests, prolonged their hospital stay and increased the cost of healthcare. Most patients were unable to afford high costs, and hospitalization often meant loss of their daily wages. We wanted to design an electronic hospital information system that would enhance doctors' workflow and improve the quality of care.

THE PRACTICE

We asked a section of the stakeholders—interns, residents, nurses, paramedics, and doctors—about their wish list: reduce the drudgery of handwritten forms, prescriptions, data entry and discharge summaries and replace them with an electronic system in which health data could be easily entered, stored and retrieved. In addition, the health professionals expected that they should be able to access records anytime, anywhere on campus. We also needed a current and reliable clinical decision support resource to help us answer clinical questions quickly and easily at the point of care.

To do so, we (1) replaced the existing paper-based systems with an electronic hospital information system (HIS); (2) introduced campus wide wireless connectivity; (3) brought in a picture archival and communication system (PACS); (4) developed an app on iPad that brought data at the point of care.

The Hospital Information System (HIS) at MGIMS is a state-of-the-art, fully integrated hospital information system. The system provides the health workers in the hospital with a full suite of tools for registering patients, ordering tests, retrieving test results and generating electronic discharge summaries.

In 2005, MGIMS introduced HIS in the hospital. It took two years to conceive, design, test and implement this system. Faculty members and the HIS staff teamed with system developers from C-DAC, Noida to design this system that MGIMS is justifiably proud of. The entire project was funded by the Ministry of Information Technology, Government of India.

This system (2 servers, close to 300 desktops) captures, stores and retrieves all data related to half a million outpatients and 50,000 inpatients every year. Most laboratories are paperless now, and residents and consultants are able to access all test results, radiologic images—anytime anywhere. The wireless connectivity of the campus has greatly helped all caregivers access information, real-time. The system has close to 18 modules—all functioning—that capture data from registration, insurance, admission counters, outpatient departments, labs (Pathology, Microbiology, Biochemistry and Radiology), inpatient departments, blood bank, operating rooms, Pharmacy, Kitchen and discharge counter. A Picture Archival and Communication System (PACS) now enables doctors to access the radiology images (radiographs, CT images, MRI images and USG) on their desktops.

The unique addition to the system is the use of iPads at the point of care—now the doctors can access the patient data at the point of care. This application – specially designed and developed for MGIMS- has been introduced for the first time in India- few public or private hospital in the country are using iPads at the point of care. They can peep into the patients' records, review past histories, and generate electronic discharge summaries using this system

EVIDENCE OF SUCCESS

HIS at MGIMS has led to a dramatic transformation in the delivery of health care making it safer, more effective, and more efficient. The system has minimized human errors, increased the accuracy of data and improved patient outcomes.

Doctors can get a complete picture of a patient's present and past illnesses online. Laboratory investigations are immediately available to clinicians. Sometimes, by the time a patient goes back from the radiology department to his clinician, he can find his doctor viewing his Xrays on his computer. This radical decrease in turnaround times meant less waiting times for poor patients. Adding an evening outpatient department ensures that laboratory results are available within a few hours of the blood draw and patients can get a diagnosis and treatment and catch the evening train back home. The administration finds it easier to assess departmental performance and can use these data meaningfully for equipping the departments.

Doctors not only can access patients' data at the point of care on their smart phones and iPads, but by using UpToDate and other electronic knowledge resources at the patients' bedside, they can act on this information and treat their patients with evidence based interventions. Residents have learnt how to inject science into the art of medicine and use diagnostics and therapies that work. Easy availability of patient data on the rounds has reduced the frequency of diagnostic and therapeutic errors. Further, it is now possible to involve patients in their own health using graphs from the HIS to show how their health parameters are changing with medication. Residents are able to create discharge summaries from the comfort of their hostel rooms and interns don't have to collect reports. This paperless way of functioning has made life easier for everybody.

Nurses can now assign beds to patients electronically, and order stocks of medicines online. It has reduced wastage, controlled pilferage and cut costs. The two pharmacies in the hospital now dispense drugs to around 2000 patients daily. By creating an interphase between electronic cell counters and autoanalyzers, test results automatically find their way into the HIS, significantly reducing the time for manual entry of results.

Students now have access to a whole range of electronic knowledge resources through wifi.

The cultural hesitation in asking teachers questions on email is fast disappearing. Conducting research has become easier as patient follow up data are easily available. Google drives are used to share resources and Google made online forms are used to design innovative assignments.

A poster presentation on the use of Ipads at the point of care won the best paper award in an international conference in South Africa in 2015.

PROBLEMS ENCOUNTERED AND RESOURCE REQUIRED

The major challenge was not financial, but in getting people in a village to accept and use technology. This has been a slow, arduous process but our decade long experiment seems to have paid off.

Several meetings and workshops were held to familiarize and encourage health care personnel at all levels to use and try the system. Interestingly enough, it was the nurses and interns, rather than doctors who displayed most enthusiasm in accepting this change in their way of working. For both, it meant, doing away with paperwork and going through their daily duties much faster than before. Eventually, peer pressure and word of the mouth worked. Now all the laboratory technicians, nurses, health aides and doctors have acquired skills to use this system that provides them quick access to patients' medical information, helps them save time and devote it to achieve better patient outcomes.

To encourage use of technology, MGIMS twice negotiated with IBM and procured 600 laptops at discounted prices in 2005 and 2009. Students and faculty were given interest free loans to own these laptops. In 2012, MGIMS bought 60 iPads and a dozen Macbooks. This created a surge in the use of computers on campus. Workplaces became more productive and learning became fun

Further, the National Knowledge Network of the Government of India offered MGIMS broadband internet connectivity that offers a high speed wireless network to the students and staff on the campus. The network, spread over 25 kms, allows students and faculty many of whom are located in the peripheral rural centers off campus, the freedom to make use of wifi enabled devices to connect to the Internet at speeds of up to 1 GBPS.

Using a brainwave, in 2011, one of our students wrote to Google requesting a waiver to create an institutional intramail, and got 2000 email IDs free of charge. It changed the way we communicated and learnt. Students, interns, residents, faculty, administrative staff and paramedics are assigned unique IDs and passwords after their smartphones, iPads, laptops and desktops are registered at the HIS and enjoy being electronically connected with the world wide web, anytime, anywhere on campus.




DEAN
MGIMS, SEWAGRAM