

## Computerised data-based programs and pain management clinic system

Medical Informatics comprises the theoretical and practical aspects of information processing and communication, based on knowledge and experience derived from processes in medicine and healthcare. The processing takes place within computers ranging from large supercomputers for research, high performance work stations for image processing and retrieval to smart phones which support mobility and pervasive health applications. A variety of Operating Systems are used, dominated by Microsoft and Linux. The latter promotes an 'open source' approach, which is favoured by many in health. In today's 'connected health' paradigm, end-user devices are linked to hospital servers, each other and the Internet. This requires knowledge and understanding of security considerations which are important in this discipline, due to the ethical dimension of healthcare.<sup>1</sup>

Health informatics have played multi-dimensional role in healthcare systems throughout the world. One such application is electronic health records (EHRs), which have the potential to advance the quality of health care by providing timely access to patients' health information, tracking patients over time to ensure that they receive guideline-recommended care, and offering decision-support mechanisms to reduce medical errors.<sup>2-7</sup>

Similarly, two more applications are: "rapid learning healthcare" and e-cards also known as smart cards. "Rapid learning healthcare" presents a new infrastructure to support comparative effectiveness research. By leveraging heterogeneous datasets (eg, clinical, administrative, genomic, registry, and research), health information technology, and sophisticated iterative analyses, rapid learning healthcare provides a real-time framework in which clinical studies can evaluate the relative impact of therapeutic approaches on a diverse array of measures.

Smart cards are used in information technologies as portable integrated devices with data storage and data processing capabilities. As in other fields, smart card use in health systems became popular due to their increased capacity and performance. Their efficient use with easy and fast data access facilities leads to implementation particularly widespread in security systems. A smart card based healthcare information system has been developed

for personal identification and transfer of health data and data communication.<sup>8,9</sup>

The applications are endless, and healthcare industry has been quick to adopt these for the benefit of all. Now all hospitals in the developed world and major health institutions in the developing countries utilize electronic record keeping facilities.

Microsoft Data Based Programs are committed to improve health care around the world through software innovation. Over the last two decade these programs have steadily increased their utilization with a focus on addressing the challenges for the health care providers, health organizations, and the patients or payers (companies) worldwide. Currently, a variety of data based programs is available to cater the needs in health care with primary objective to improve physician efficiency and the outcomes for the patients by allowing physicians to efficiently view, track and measure their data. As the prevalence of chronic disease rises at an alarming rate worldwide with the growing ratio of middle and old age people, these computerized programs are able to store vital patient-related information and can provide us the required details at a click by the healthcare provider and play an important part in the management of chronic disease as well as enable us to analyse the data for research purposes.

Aga Khan University Hospital, Karachi, (AKUH, K) started operations in 1985 as an integrated health care delivery component of Aga Khan University (AKU). It is a philanthropic, not-for-profit, private teaching institution committed to providing the best possible facilities for the diagnosis and team management of the patients. AKUH's multidisciplinary approach to diagnosis and care ensures a continuum of safe and high-quality care for patients – all services under one roof. Department of Anesthesiology has been providing pain management service for a variety of patients. The acute pain management service provides 24 hours coverage to all postoperative surgical patients and uses different modalities of pain control including lumbar / thoracic epidural infusion, patient controlled analgesia, intravenous infusion and continuous neural block. The

chronic pain management services provide experience in the multidisciplinary management of chronic pain syndrome. There is a fully-equipped out-patient pain clinic, offering four clinics per week. Chronic pain management team offers complete evaluation and treatment of a variety of pain conditions such as low back pain, cancer pain, complex regional pain syndrome, neuropathic pain, myofascial pain etc.

Pain is the most frequent physical complaint world wide. Empirical data document the prevalence of chronic pain in their population ranging from 20-80%. Back pain afflicts approximately 31 million Americans, and is the number one cause of activity limitation in young adults.<sup>10-11</sup> However, compared with the western data there has been little research done in Pakistan and not enough data and recording system is available for the prevalence of chronic pain.

Considering the importance of Microsoft data based program AKUH uses a software program to maintain a computer-based record of all the patients with chronic pain presenting to the Chronic Pain Clinic in our hospital. This software program has been installed on Sahl as PMCS (Pain Management Clinic System). Initially a retrospective medical record file review was conducted to convert the data from hard copy of a structured pain clinic form or Performa to software program<sup>12</sup>. All medical records of patients presenting to the Chronic Pain Clinic at Aga Khan University Hospital Karachi from January 2001 to February 2006 were entered in the program in 15 variables, including serial no, MR No, age, sex, referral by any other specialty or self, initial visit or follow up, current pain score (1-10), diagnosis, mood status and sleep hours per day. Other information including duration of pain, numbers of doctors seen prior to presentation, treatment given in our hospital and any future treatment plan including conservation or intervention was also included.

Patients having their initial visits starting in March 2006 were directly entered in the soft ware program in the outpatient clinic. The record of patients presenting in our out patient clinic and the treatment that they underwent along with other variables is made on PMCS in order to have an effective and rapidly accessible computer-based data entry of our chronic pain patients presenting at AKUH and utilizing this data for more clinical research in future. We believe that this Microsoft Program really helped us in ensuring the best and affordable quality care

for everyone visiting our pain clinic.

The electronic applications have the main advantage of ease of and more efficient record keeping, rapid retrieval of information and extensive utilisation in research, thus indirectly promoting healthcare in the world. However, cross-sectional studies have failed to show a direct correlation between having an EHR and high levels of quality of care,<sup>13,14</sup> suggesting that simply having an EHR may not be sufficient to improve quality and safety of health care. Nonetheless, randomized controlled trials demonstrate clearly that quality improvement occurs when specific decision support is in place.<sup>15,16</sup> Other factors, such as presence of order entry and better training and implementation of EHR systems, are likely also needed to achieve higher levels of quality and safety.<sup>17</sup>

EHR systems may well improve the patient satisfaction levels with the passage of time, with universal acceptance. The patient-physician interaction will always remain the mainstay in patient satisfaction. Most patients in a study expressed no preference for whether or not computers were used in their physicians' offices, although computers did seem to have a positive effect on overall satisfaction with visits. Doctors' attitudes toward computer use influenced their patients' preferences.<sup>18</sup>

The practicing physicians of developing world are still on the way to understand the influence of the advanced technology on the overall health care. It is time that we understand now that without embracing the technology we cannot keep pace with the advanced world so we should strive for the technology for long term benefits.

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