

NOVEL WAYS TO INCREASE MEDICAL INFORMATICS USE BY CLINICIANS

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Received: June 11, 2005 Accepted: April 23, 2006

ABSTRACT

Medical informatics is a multi disciplinary field, which combines different disciplines of medicine with information technology. Some of the major components of Medical Informatics are Hospital Information System, Computer based patient record, Medical imaging, Telemedicine, Bio informatics and Expert system or Artificial Intelligence, Neural networks and Robotics. In a medical college setting there are data analysis tools like S.P.S.S, presentation tools, e learning and web portals for students. (Rawal Med J 2006;31:38-39).

INTRODUCTION

Medical informatics is located at the intersection of information technology and the different disciplines of medicine and health care. Therefore, the domain of medical informatics is determined by the combination of the terms "medicine" and "informatics." The first term indicates the area of research while the second one is its methodology.^{1,2} Top 10 Medical Universities in America have a separate department of Medical Informatics in their Medical Colleges where Medical Informatics applications are in place.³ Some of the major components of Medical Informatics are Hospital Information system (HIS), Computer-based patient records (new name is Electronic Medical Record), Telemedicine, Bioinformatics, Expert System, Artificial Intelligence and Robotics.⁴

HOSPITAL INFORMATION SYSTEM

The Hospital Information System incorporates information from the several departments within the hospital, like pharmacy, radiology and pathology laboratories. HIS captures patient data from various departments and this can be used for students, physicians, biostatisticians for research and also can be used for the purposes like billing, human resource development and for hospital Administration.⁵

As an example, a network of associated hospitals in the East Coast may want to utilize an expert system that was created and maintained by Stanford University. Data in this system can be used from any physical location and for many purposes like making medical queries or for medical statistics. In another example, a wireless personal digital assistant (P.D.A) may be connected with HIS, and when consultant enters into hospital vicinity this device generates an alert and guides the consultant to a patient who is in serious condition. He, even in a parking lot, can access important information about this patient.⁶

ELECTRONIC MEDICAL RECORDS

With the integrated clinical database, the health care provider can view all information regarding patient directly on a single screen. This information from all departments is formatted in such a way that facilitates the evaluation of the patient in global view.⁷

CLINICAL DECISION SUPPORT SYSTEMS

Clinical decision support system (CDSS) is computer software designed to aid clinical decision making. The system gives a probable diagnosis after compiling results, on the basis of findings which are present in history and laboratory investigations.⁸

TELEMEDICINE

In this technology, clinical data including history, laboratory reports and picture achieves like X-Ray, CT scan or MRI are exchanged on two different locations. Patients on one location receives proficient medical advice even when they and their local family practitioners are far from their consulting physicians, present at another far away location. All data is transferred through internet via DSL connectivity¹³ and digital images of x-rays, CT scan and M.R.I can be transmitted.⁹

Teledermatology¹⁰ is used when a live image of a skin lesion is transferred through internet to the consultant sitting at different location. He examines the image and gives opinion through teledermatology to the referring physician so that treatment is given to the patient.¹⁰ Surgeon at the different location controls the Robotic arm fitted with numerous cameras and can perform surgery at the different location. This type of surgery is known as Telesurgery.¹¹

BIOINFORMATICS

Bioinformatics is field which deals with chromosome sequences and classification, in which several clinical disorders, which are related to chromosomal abnormalities, are identified quiet accurately. Automated computer system is used to create and maintain these databases of chromosomes and helps in comparing and identification of abnormalities.¹²


ARTIFICIAL INTELLIGENCE SYSTEMS

Artificial Intelligence and expert system are the most intelligent software of the world. The principal on which Artificial Intelligence and Expert System works is signal processing and pattern recognition. A Silicon Retina (bionic eye) has been developed which tracks bright and dark spots capable of producing a vague image to the blind person so that he can at least walk with his blindness. Artificial Intelligence system can help in diagnosing the size, shape and even classify different type breast tumors during mammography.¹³

MEDICAL INFORMATICS IN MEDICAL COLLEGE SETTING

A separate department, which works on different projects and design different courses, is working in some medical colleges. It develops web portal for the students to share and download medicine related information and web resources. It produces different department web sites, web based discussion boards and other medical software. It is also involved in conducting courses like medical informatics course, S.P.S.S and Endnotes courses for the faculty members and staff.^{2,3} Medical Informatics has recently become a part of undergraduate curriculum in many Medical Universities.

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