

COMPUTERS IN MEDICAL EDUCATION AND RESEARCH

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History of computers

- First computer in 1830 – Charles Babbage
- First in India – 1955
- Indian Statistical Institute, Kolkata.

“Why computerize ?”

- Better administration
- Better cost : benefit ratio
- Better utilization of time
- Increased efficiency and reduced human errors
- Regular updated information

“Why computerize?”

- Potential to streamline Medical education and care
- Good penetration into Medical education in USA, UK and Canada.
- National Program of IT in Medicine

Applications being used in medicine

- **Email** – ability to transmit text and graphics online
- **Chats** – real time communication tools to contact specialists and peers
- **Power point** – has radically changed the act of seminars and presentations

Websites

- Specialized health care web sites e.g www.medscape.com and www.emedicine.com
- Indian websites also available but most not regularly updated
- Streaming multimedia – observe and learn surgical procedures as virtual reality e.g www.vh.org

Data storage , Retrieval and Assessment

- Core of patient management and care
- Essential learning experience for residents
- Personal and academic records of students
- At present done manually
- Paperless records with multiple access facility

Alternative teaching methods

- Increased demands of patient care lead to less teaching time
- Multimedia presentations as substitute to lectures and tutorials
- Uniform MCQ based testing modules as a substitute for tests and tutorials
- Virtual patients to enhance clinical experience

Simulation models

- Anatomical simulations to replace dissection
- Digitalization of Histological and Pathological slides
- Freedom to learn anywhere

Alternatives to Animal Experiments

- Essential part of medical education
- 3 R's
 - R – Refine
 - R – Reduce
 - R – Replace
- Models for toxicological evaluation of drugs
- Computer based evaluation of various parameters

Role in Preventive Medicine

- Management and statistical analysis of data
- Review of health care services
- Epidemiological research
- Online awareness programs about preventive aspects of disease

E Books/Palmtops/PDA's

- Reduce need to memorise facts/data
- Drug – Drug interactions software
- Medical records at hand
- Drug dosage calculation software
- Palmtop/PDA version of medical journals

Evidence Based Medicine

‘ the use of best, most appropriate and latest medical knowledge, from medical literature to treat a particular patient instead of adhering to the standard or established protocols’

Evidence Based Medicine

- Requires a thorough search of literature
- Internet overcomes the handicap of non availability of printed journals
- Evolution of medicine

Regulatory guidelines

- Issued by associations/ organizations
- Ensure uniform working of members
- Offer news and views on topics of importance
- Official websites / internet an important medium for dissemination of information

Continuing Medical Education

- Helps to continuously update knowledge and skills
- Mandatory by certain state licensing boards in the USA
- Till now voluntary in India
- Online CME's – a revolutionary vision

Problem based learning

- Focused methodology
- Addresses specific needs and requirements
- Provides individualized solutions
- Specialized software to identify problem areas
- Specialized websites as www.gsm.com

e- Consultations

- e- Patients and e- Consultants
- e- Mail , web cams and videoconferencing
- important media
- Internet also serves as a quick link between various departments
- Continuous Holter monitoring

Blogs/ Bulletin boards

- Areas on the net dealing with specialized topics
- Open to all
- Postings by doctors as well as patients e.g Medpundit and Living with diabetes
- Medical student and intern blogs also exist
- Serve as useful sources of information e.g Non harmful and bedside.org

Drug info online

- Latest guidelines and cautions about drugs on www.fda.gov
- British National Formulary gives general info about Drugs
- Separate information for doctors and patients
- Continuously updated databases

Role in medical research

- Part of all important research protocols
- Pre- research organization
- Information assimilation
- Actual research process involves computers to the core

Online Databases

- Store houses of medical literature
- Free as well as paid information
- MEDLINE
- OVID
- EMBASE
- COCHRANE
- MEDLARS
- AIDSLINE
- TOXNET

Online medical journals

- Literature search a pre- requisite to research
- Role of open access in increasing the availability of literature
- Rapid links to articles in bibliography- www.crossref.org
- e- library – www.medbioworld.com

Genomics

- Computers and genetic research inseparable
- Human Genome Project – world wide linking of computers
- Mouse Genetic Maps available online
- Software to correlate research on mice to humans
- Databases of transgenic animals

Limitations

- Not a substitute for psychomotor skills
- A big financial investment
- Requires knowledge of computer skills
- Problem with availability of medical software
- Not a replacement for real patients
- Obsolence

Indian scenario

- Only limited role of computers in Indian education system
- Accepted only by individuals who are aware of the potential of this technology
- Indian education system different from that of west
- Most Indians still do not have access to computers and internet

“ Are we ready ?”

Lester's Law:

“Medical knowledge is a social process,
the conversations that occur around
artefactual data are
always more
important than the data itself.”

THANK YOU!

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