

## Computer applications and Internet services in medicine and health care

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### ABSTRACT

With continuing advances in information and communication technology, the application of computers in medicine have increased rapidly, as well as their potential to revolutionise health care. Computers can be used in hospitals at the reception, billing, admission, OPD's registration, laboratories, radiology, OT endoscopes) and patient management in wards. The Internet is transforming health care. It is creating a new conduit not only for communication but also in the access, sharing, and exchange of information among people and machines. Recent developments indicate that the Internet can also foster a new level of knowledge among patients, enabling them to have input into decision making about their health care. With the advent of the Internet, information resources are now open to one's finger touch. Literature search can be done on databases such as MEDLINE, EMBASE and BIOSIS as well as on other Web sites very quickly.

### INTRODUCTION

The information technology revolution is being described as the most important development in the history of mankind since the industrial revolution. It has the potential to change the ways of man and society beyond the wildest of imaginations.

The computer, invented initially to process information, slowly grew into a storehouse of information. It then became sophisticated and even more powerful and got hooked to others of its kind to form a formidable network. This network further acquired the capability of distributing electronically processed information to all and sundry, overcoming every conceivable form of barrier, including geographical and political. Today, it is a global collaborative medium and a rich resource of information of all kinds - science, technology, research, education, and commerce. Through a host of emerging tools and protocols, it enables person – to- person. Computer -to- computer, or person-to- computer communication (Suman, 2001).

With continuing advances in information and communication technology, the applications of computers in medicine have increased rapidly and have potential to revolutionise health care. Medical informatics addresses profound needs in medicine. Clinicians face and ever-growing plethora of diagnostic and therapeutic options and volumes of data relevant of patients with critical or chronic conditions.

Students of medicine dallied professions must assimilate volumes of factual, conceptual and procedural knowledge that defy traditional education media. Biomedical researchers in the quest to expand current medical knowledge swim in a sea of million pages of biomedical literature published annually, making communication of new findings among colleagues difficult and dissemination to health care professionals impossible (Hersh, 1999). Added to these are the growing needs of health service and public health researchers to measure and improve the quality of health care and health care systems. Evaluating the efficacy, efficecy and cost of clinical care requires novel approaches to data acquisition and analysis. Computers and Internet services offer the promise of capturing, organizing and presenting medical information in a form that will make it useful to all in the health care area.

### METHODOLOGY

#### Use of computer in health care

Computers have become part of daily life and have changed the way many people live. They have changed the way in which medicine is practiced. Computers are increasingly being used in medicine because the advances in computer technology have made them user friendly and cheap. The availability of good and effective software has also helped in opening up a lot of possibilities for their application in the medical field. Computers can be used in hospitals at the reception, billing, admission, OPD's registration, laboratories, radiology, and patient management in the wards.

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Manuscript received by the Editor November 3, 2005; revised manuscript accepted November. 23, 2006.

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Nowadays, nearly all medical conferences use computers and internet by having their own web sites, registration and abstract submission by email and the conference proceeding and abstracts provided online or on CDROM (Alejandro, 1999). The use of computers in most spheres of medicine has rendered the use of Internet for medical research very easy.

## RESULTS

### The internet: it's role in health care

The Internet is an extensive network of computers around the world or a huge library of information on computers, classified into web sites. It was Created in 1969, by the Advanced Research Projects Agency of US Department of Defense. The Internet, with its powerful penetration and scalability has become an increasingly rephrase popular medical information resource. By redesigning the work place around computer-based Technology, doctors, researchers, and other health care providers are creating a new vision of work and organization in such areas as patient care, medical and health education, and research. This evolving technology includes the electronic medical record, the Internet with its e-mail. W.W.W (World Wide Web),. and file transfer capabilities.

Electronic mail has the potential to enhance the professional relations both between Physician and patient, among physicians of the same and different specialties. E-mail is the most useful resource extending the avenues of learning to an international audience through news or list-server groups. Associations, departments, educational sites, organizations, peer review scientific journals, and Medline database web pages of prime interest to healthcare providers have been developing at an amazing pace. The WWW provides an all-in-one medium for image, sound, and video. A worldwide web is the best method of electronic publishing and many magazines and newspapers are available on the Internet. Further developments of technological advance nurturing our interests will consist of on-line journals, telemedicine as well as advances in health screening and assessment, computer-based training and education in different fields of medicine, and centralization of cyberspace information into database search sites (Lowe et al. 1996). The Internet, which allows instant transmission of text and graphics and permits talking via computers, is the ideal medium for sharing medical expertise. It can save precious human life; help treatment in difficult and complicated cases by seeking expert opinion on the Internet and above all, facilitate quick exchange of ideas. This could well lead to valuable innovations and discoveries (Kurzweil, 1999).

A quarter of the material on the Internet is now health-related, and about a third of web surfaces are searching for health information (Coiera, 1996). Healthcare professionals can retrieve a lot of information on such subjects as AIDS, emergency medicine, geriatrics, orthopaedics, rehabilitation, preventive medicine, public health, rural

medicine, transplant medicine etc on many web site. Information on higher education in medical sciences and job opportunities in different hospitals and research institutes can also be found on the internet.

Medicine is an area that generates a wealth of information in the form of journals, reports, conference proceedings, etc. It is difficult for a healthcare professional to keep abreast of all the developments taking place in one's field of interest in view of the phenomenal growth of medical journals. With the advent of the internet, information resources (e.g. online databases, CD-ROM, producers full-text documents of various societies, and the commercial agencies, news groups, directories, individual home pages, and corporate resources) are now open to one's finger touch. Literature search can be done on databases such as MEDLINE, EMBASE and BIOSIS as well as on other web sites in no time (Culver et al., 1997). Healthcare professionals can also get information on health workers, societies and hospital, healthcare companies, and on healthcare management and policy. On an exploratory browsing of the Internet, they can query a database for known references or retrieve an exhaustive list of relevant material to review the available literature or pull up a list of first question recent references to answer a particular question (Hersh, 1999).

A large amount of information on patient care, education, and support is available. Most health sites have traditionally been information-based and the Internet is, for example, the best way to find a self-help group for any disease. It is also a huge source of details on individual disease, no matter how obscure, and is increasingly being used by patients as a way of locating the best hospitals and doctors. Changes in healthcare delivery and explosion of health information available on the Internet are already affecting primary healthcare practice in America. Modern information technology not only affects the delivery of healthcare, but also can significantly influence the doctor-patient relationship.

In future, the Internet will be used to convey more "real-time" information. A physician practicing in a rural village may consult a specialist sitting at any distance by providing him all images and data on-line, thus eliminating the risk involved in travel and also save some time and money.

Health sites are also becoming interactive. There is the new virtual checkup for women at <http://www.allhealth.com/virtual> check-up where one has to just key in a few personal factors such as blood pressure, cholesterol level, lifestyle details and family profile. Virtual checkup also has sites that will assess individual risks for osteoporosis and heart disease. Other health sites are already offering heart monitoring and cancer risk assessments, opinions on best prescriptions to seek and virtual health shops offering a multitude of health supplements (Suman, 2001).

While Internet technology has dramatically improved the access to health material, the biggest shake-up is taking place in the General Physician's Clinic. Doctors can key their patients symptoms into a computer and receive an instant diagnosis. In several areas of the UK, doctors are using ISSN-based technology to enable a medical consultant to examine patients 120 miles away. Such technology will mean that, in 20 years time, many patients will no longer need to travel to see a specialist. Diagnosis will be made in their family doctor's clinic, by a consultant examining them with the help of video images and remote sensors that can relay data on blood pressure, heart rate and other vital signs. The Internet is also set to allow doctors to change the way they treat patients.

Ultimately, the medical world has greatly benefited and stands to gain more from the Internet, with the understanding that there are inherent risks with current on-line practices. The crucial step of identifying these risks and increasing societal awareness is being effectively pursued, so that future technological, legal, and standardized developments may reduce any danger to physicians and patients.

### CONCLUSION

The use of computers and internet services in medicine and health care is likely to increase. The World Health Organization (WHO) is very much aware of the importance of computers and Internet services in modern medicine, and some positive steps towards widespread adoption must be encouraged. Hospitals should take responsibility for building digital collections of various types, thus optimizing the advantages of the availability of the internet.

Nonetheless, computer applications and internet services in Medicine and Health care is still in its infancy in Nigeria. Computers and Internet services ought to be made available in all hospital department including laboratories so that health professionals can easily enter and analyze data as well as prepare reports.

Computer science courses taken by students in the health preparation should be designed to include application such as Microsoft office, bigrams and the Internet.

### ACKNOWLEDGEMENT

We are grateful to Dr. E. A. Nwokoro. Association Programm and Head. Department of medical Laboratory Sciences, Imo State University. Owerri, Nigeria, for his encouragement and review of this manuscript.

### REFERENCES

- Alejandro, R. 1. (1999). Promoting partnership: challenges for the Internet age. *British Medical Journal* 319: 761-764
- Coiera, F. (1996). The Internet challenge to health care provision. *British Medical Journal*. 312: 3-4
- Culver, J. D, Gerr, F. and Frumkin, H. (1997). Medical information on the Internet: a study of an electronic bulletin board. *J. Gen. Intern. Med.* 12:466 – 477.
- Hersh, W. (1999). "A world of knowledge at your fingertips" the promise, reality and future directions of on-line information retrieval. *Acad. Med.* 74: 240-243.
- Kurzweil, R. (1999). The age of spiritual machines: when computers exceed human intelligence. Viking, New York, 67.
- Lowe, H. J., Lomax, E. C. and Polonkey, S. E. (1996). The World Wide Web: a review of an emerging internet-based technology for the distribution of biomedical information. *J. Am. Med. Inform. Assoc.* 3: 1- 4.
- Suman, K. (2001). The Internet: Its role in medicine and healthcare. *Journal of the Indian Academy of Clinical Medicine* 2(3): 133-137.