

Orthopaedics in Era of Computers and Internet

Jain S

Mahatma Gandhi Memorial Medical College, Indore

Today, computers are a part of our life & have changed the way we live and the way we practice medicine. Their qualities as user friendly, cheap, availability, time saving, multitasking, documentation, and knowledge update has helped in opening up a lot of possibilities for their application in the medical field.

Computers are already being increasingly used in hospitals at the reception, billing, admission, OPD registration, laboratory, radiology, 3-D reconstruction in CT, MRI, in O.T., endoscopies and patient management in wards. Personally, computers are also used by doctors for their practice management-recording patient history, writing prescription, maintaining treatment history, accounts and billing, scheduling appointments and managing correspondence-letters, messages, emails, paper, the forum for the discussion of orthopaedic problems, usually on a case-by-case basis. Now nearly all medical conferences use computer and internet – by having their own website, registration and abstract submission online or by email and conference proceeding and abstracts are provided online or on CD ROM.

There are over two million health websites & nearly thousand are added each month. The health is the second most searched for topic on the net. Health related net usage in India has grown over 10 folds with 40 million users. A survey on internet found that 69% of the patients discuss the information found on net with their health care professionals. 80% doctors found this to be helpful, as it has improved communication, knowledge and saved time in explanation to the patients. While the rest felt, there was risk of patient's self-treatment. The shortcomings to internet usage include lack of time, poor quality of information, unsolicited email, time wasting searches and excessive commercial emphasis.

Though, Orthopaedic surgery has not yet fully grasped the remarkable potential of information technology but surely there has been increasing application of computers in orthopaedics, with special emphasis on the emerging importance of virtual reality in all aspects of orthopedics. Today the computers and technology is used for all aspects of orthopaedics, ranging from pre-operative planning, pre-operative surgical practice on virtual patients, and virtual way finding and navigation; through intra-operative virtual bone structure modeling to enhance accuracy; to, most importantly, post-operative or non-operative rehabilitation of orthopedic conditions using these new computer techniques.

Although the technology has been used in all fields of orthopaedics but it is particularly, been of great help in fields of arthroplasty, deformity correction, documentation and knowledge update.

Computer Assisted Surgery / Computer navigations is been increasing used in replacement surgeries. It has been extensively used for knee, but has also been extended to hip, shoulder and other joint replacements as well. The computer assisted surgery (CAS) is more precise, user friendly, lessor risk, economical and with fewer complications. These are particularly useful for a complex joints and deformed bones where anatomic landmarks are difficult to assess accurately. The robotic surgery is a further advancement, and robots for hip and knee replacement are increasingly used in western world to improve the accuracy and outcomes.

Use of computers in deformity correction is tremendously advantageous. It is extremely useful in assessing the deformity and planning the correction. There are various tools and softwares available for evaluation of the deformities and to guide the correction of the deformities. Computer assisted insertion of

pedicle screws in scoliosis surgery has, increased the precision of the screw placement and decreased the complications of misplacement of the screws or nerve / cord penetration. Today computer assisted hexapods fixators are available for three dimensional deformity corrections. These hexapods like SUV fixator or TSF have made the deformity correction so easy. The surgeon just has to apply the fixator on the patients deformed limb. Then the data needs to be put in the computer software, which then calculates everything and makes a exact model of the limb along fixator in place. The deformity correction can be manipulated and corrected as per the needs, which can be seen on computer software, with days and correction achieved, on screen without been correction actually done on limb. Thus in this way you can access the final correction and can change your rate of correction, if needed. It gives you precision and flexibility in correction. The surgeon can achieve corrections of deformity to 1mm and one degree very precisely with simultaneous correction in all the planes.

Another major step, which technology and computers has helped, is the knowledge update. Today the whole global world is shrinking, with all the knowledge and information available just at a click away from you. There are many website, applications and videos, available which can help you to learn orthopaedics, get knowledge update, see operative technique and read latest articles.

Mobiles, and applications like whatsapp and facebook are very power tools for information sharing not only among general people, but also among orthopods not only to keep contacted with peers but also for opinion, discussion, promotion and for knowledge sharing. Since orthopaedics is a branch which is more dependent on radiological investigation, which can be easily shared and transferred on these social media platforms, these applications have revolutionized the practice of Orthopaedics.

While computer systems are becoming ever more powerful aid to problem-solving but there remains a critical role for intangible

human skills such as intuition, experience and imagination. Aging, time and human contact are significant factors. Computer system can never replace human pattern recognition and memory. There is other side of coin also. Patients in search of answers seldom appreciate the difference between obtaining orthopaedic information and an opinion about an individual case. It is manifestly unethical and illegally perilous and downright stupid for an orthopaedic surgeon to offer an orthopaedic opinion on a patient whom he or she has never seen, examined or investigated. Further, Orthopods for their own promotion shows only the best functional outcome of their own case and tend to hide their complications. With the globalization of information, there is also hazard of leaking of secrecy of the patient.

Without a vision and planning, global orthopaedic surgery on the Internet will evolve through chaos and endangered future. It is clear that patients will continue to use the Internet for orthopaedic information and that it is up to us to provide good information and guide them to it. But we should also know the line and limit, for the level of knowledge which should be freely available to the layman, to prevent the misuse of the information. The simple and easy way is, Orthopaedic organizations should focus on networked resources and start website providing valuable public-relations exercise & information about the practice of orthopaedics at several levels such as practical directions for patients, information about orthopaedic conditions, its natural history, options of non-operative and operative treatment, complications and outcomes, scheduling, teaching commitments, case presentations, information about research, and meetings. This requires expert orthopaedic personnel who have the correct skills of knowledge, management and training in organising information in using computers. We as orthopaedic surgeons needs to change existing patterns of behavior with overcoming our inhibitions and has to incorporated the advancing technology into our behavior and orthopaedic practice, because advantages of using computers in orthopaedics are many and the disadvantages can be overruled easily.

The pace with which the Internet and technology has penetrated to an individual level is remarkable but it is not yet integrated into the working patterns of most of us. You won't become an expert overnight, but by starting with the basics and taking online computer training courses whenever possible, can quickly amass an impressive set of marketable skills. Computers are clearly here to stay, so if you want technical training that will help solidify your future, secure the necessary education first. The world has an insatiable appetite for computer technology, and those who have the skills necessary to satisfy that demand are the ones who will be calling the shots in the years to come.

Dr Saurabh Jain
Editor, OJMPC

To conclude, the Internet and computer networks may not need promotion but orthopaedic surgery on the Internet assuredly does. Innovations and change in orthopaedic computing and networks are welcomed by some, but are perceived by others as unacceptable system-changing risks, often unrelated to the benefits which they purport to provide, because instinctive opposition to 'computer medicine' is inherent. But it is sure than technology and computers as well as the patients urge are to stay here and if we don't keep ourselves, with the same pace of development as that of technology, we will be left behind.