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The impact of information technology on medicine

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No-one can deny that information technology (IT) is changing the way that medicine is practised. The fact that you are actually reading this editorial is clear evidence of it. This journal would probably not be in existence if it weren't for the availability of effective and affordable IT.

Most of the early applications of IT were geared towards number crunching. The heart of any computer is the central processing unit (CPU) where arithmetic and logic operations are carried out. In the early days of computing, emphasis was on pure processing power for mathematical and statistical purposes, and at this time the impact on medicine was minimal.

Things changed however when the focus of attention shifted to the relationship between the human and the computer and the ways in which a human can become more productive and information-efficient with the help of IT. There followed a systematic analysis of human tasks and activities and an attempt to improve these by means of computer applications. Medicine then became fertile ground for development, and the concepts of expert systems in medicine emerged, with systems for computer-aided history-taking and diagnosis. In the long run, however, it was the more mundane IT applications such as word-processing and database management systems that penetrated the everyday practice of the working clinician, and even more the world of health services management. The first sectors of hospital activity that benefitted tangibly from IT were patient administration, laboratories and accounts – not surprising, considering the large volumes of numeric data that these sectors handle. At the same time, clinical activities involving calculations were greatly facilitated – the days of nomograms were numbered. The next significant development was the convergence of information and communication technologies. This led to a veritable boom in networking both within and between organisations. The first major effect of this, in the early

90's, was the evolution of data sharing concepts and the emergence of integrated information systems. Hospital information systems developed and started to take rich data (sounds, images, movies) on board. The acquisition, storage and transmission of medical data, especially from medical instrumentation, became increasingly digital, rendering the total electronic health record feasible. The second major effect of networking, in the mid 90's, was the explosive growth of the Internet. It became feasible to move data and information quickly and cost-effectively between any two networked PC's on the planet. This increased the potential for the communication of medical information among health professionals and patients immeasurably. The full impact of the Internet on medical practice has still to emerge.

There is no sign of slowing down in the rate of development and proliferation of information and communication technologies. In the next ten years we can expect more sophisticated human-computer interfaces with efficient voice and handwriting recognition; the penetration of techniques such as tele-surgery into mainstream clinical practice; sophisticated undergraduate and postgraduate computer-based training; and better structuring and portability of integrated electronic health records. The challenge for health professionals is to harness the new power at their disposal for the benefit of their patients.

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