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## **Editorial: Using information technology to create access, quality, and value in healthcare**

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## Introduction

Currently, healthcare organisations in the USA and globally are contending with relentless pressures to simultaneously improve services while lowering costs. There is no respite to these challenges in sight, as longer life expectancies continue to produce an aging population, and medical technologies constantly innovate to serve the increasing needs of this demographic. This special issue focuses on the role information technology (IT) can play in meeting the challenges of modern healthcare by increasing *access* to healthcare, improving overall *quality* of healthcare, and enhancing *value* of healthcare to patients and stakeholders. Each of these areas represents a critical component in the operational strategy of healthcare organisations to prosper in the coming years. Further, each area constitutes a broad topic in its own right:

*Access to healthcare* for anyone, anywhere, and at any time is a goal that is very far from being reached. Even in the USA, home of the world's most advanced and expensive healthcare system, immediate access to care is limited by lack of insurance coverage for 45 million citizens, and the situation is much worse in developing nations. Although IT cannot by itself perform such actions as diagnosing a medical condition, it can provide low-cost communication between physician and patient that makes a diagnosis possible and innovations could dramatically improve the effectiveness of such remote access. Other aspects of access are less obvious, but are critical to controlling quality and costs of healthcare. These include timely access to medical records and universal accessibility to data among disparate information systems and medical devices (AHRQ, 2003; PITAC, 2001). In each case, improvements in IT design and standards can dramatically increase access.

*Quality in healthcare* has six key goals:<sup>1</sup>

- safety, avoiding injuries to patients from the care that is intended to help them
- effectiveness, providing services based on scientific knowledge to all who could benefit and refraining from providing services to those who will not benefit (i.e. avoiding under-use and overuse)
- patient-centred, providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions
- timeliness, reducing waiting and sometimes harmful delays for both those who receive care and those who give care
- efficiency, avoiding waste
- equitability, providing care that doesn't vary in quality based on personal characteristics.

These quality aims will be negatively impacted by poor information quality, flow, and integrity. Conversely, higher quality, flow, and integrity of information can help to reduce the large number of medical errors that currently permeate the healthcare system (Geisler et al., 2003; Moore and Wesson, 2002).

*Value of healthcare* incorporates the overarching goal of increased productivity, but this goal has distinct aspects depending upon one's perspective, and only some of these aspects are primarily monetary. To patients, the value proposition may be enhanced by reducing time spent in obtaining healthcare, lowering stress and worry and increasing satisfaction with the experience. To physicians and clinical support personnel, value may

be enhanced by the ability to remotely access medical records and monitor prescribed regimens and patient symptoms. To managers and investors, value may be enhanced by lowering costs of delivering healthcare in ways that do not compromise access or quality. Because of the rapidly-decreasing cost structure of hardware, IT is now able to provide many functions that were not previously available, such as connectivity through mobile devices. Thus, IT innovations hold great potential for enhancing the value of healthcare to patients and stakeholders. Yet, it is not simply the introduction of IT per se that provides a good solution, but often it is necessary to combine IT with new management techniques such as total quality, knowledge management and business process redesign to achieve success (Sharma et al., 2004). When we look at healthcare, we can see that in order to enhance value we must not simply focus on clinical care but also be cognisant of education, research, and administrative needs of this industry.

In this special edition, we are bringing together a compilation of articles that uniquely address the creation of access, quality and value in healthcare. This process is not as straightforward as might be expected. These papers demonstrate that access, quality and value each have intertwining impacts that can confound other factors and obstruct the overarching goals of lowering costs while improving services in healthcare. In recognition of these interdependencies, the papers are organised by area or areas of access, quality, and value which they primarily address.

Access is addressed in two papers. 'Teleren' by Spanjers highlights how e-learning can facilitate the learning activities of nurses without dramatically disrupting their work schedules. 'Learning through telemedicine: case study of a wound care network' by Deng et al. explores the potential of telemedicine networks to support collaboration and learning among healthcare personnel. Both papers underscore opportunities for incorporating IT to enhance access in diverse healthcare scenarios.

Quality is the focus of two papers. 'Knowledge as process, not data: the role of process based systems in developing organisational knowledge and behaviour' by Perry discusses how dynamic knowledge created in processes can be used to improve many quality dimensions of healthcare. 'Wireless networks for enhanced monitoring of patients' by Varshney discusses key issues that need to be addressed in order to make patient monitoring by *ad hoc* wireless networks a reality. These papers highlight areas where IT coupled with management techniques such as knowledge management can improve healthcare quality.

Value is central to two additional papers. 'iRevive: a pre-hospital database system for emergency medical services' by Tollefsen et al. focuses on an important area of healthcare, namely emergency services and the capturing of critical pre-hospital data. 'Unlocking value in clinical research network data' by Lafky presents a framework for understanding the source and nature of data heterogeneity and discusses how managing emergent knowledge and applying it to clinical care can be more rapidly and easily achieved. Both papers exemplify how IT can increase the value component of healthcare when applied innovatively and in concert with managerial and clinical needs.

The issues of access, quality and value are not mutually exclusive and several papers demonstrate that these issues can be addressed in combination by a specific IT implementation. Three papers jointly address access and quality improvement. 'Implementing intranet for social and cognitive knowledge processes' by Aidemark discusses a social and cognitive approach to the planning and implementation of knowledge support systems in a healthcare organisation. 'Provider perspective of

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telemedicine encounter quality' by LeRouge et al. describes how telemedicine systems can revolutionise healthcare by enhancing quality and efficiency through virtual access. 'Implementing digital signatures for healthcare enterprises: case of online disability evaluation reports' by Tulu et al. presents a case study of a digital signature solution implementation for a healthcare organisation that provides disability evaluation services for various government agencies and private companies. The final paper in this special issue integrates all the issues we have addressed. 'Distributed, multiplatform high fidelity human patient simulation environment: a global-range simulation-based medical learning and training network' by von Lubitz et al. discusses how use of simulation methods in medical training can improve access, quality, and value in numerous areas of healthcare.

In closing, we reflect that the papers in this special issue clearly demonstrate the complexity that confronts us in successfully applying IT to provide healthcare excellence and meet the goals of lowering costs while improving services in healthcare. The papers exemplify the many approaches that may result from multiple stakeholder perspectives coupled with multiple orientations toward access, quality and value and the integral role of IT. Navigating and clarifying the complexity of this domain is difficult but an extremely important objective for researchers in IT and healthcare fields to achieve. We strongly believe that conducting research to illuminate access, quality, and value in healthcare is a global imperative for healthcare in this 21st century, and it is our hope that this special issue will serve to encourage and inspire more research in these areas.

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## Notes

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