

Can information technology improve my ambulatory practice?

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Abstract

eHealth is the use of information and communication technologies for health. mHealth is the use of mobile technology in health. As with all information technology (IT), advances in development are rapidly taking place. The application of such technology to individual ambulatory anaesthesia practice should improve the delivery of quality patient care to the patient. Improved multilevel communication and information exchange should not be to the detriment of patient confidentiality. There are various opportunities throughout the perioperative ambulatory care process for the individual anaesthesiologist to participate in eHealth. The most important contributions may manifest with improved preoperative communication, intraoperative recordkeeping and postoperative tracking of outcomes data. However, it is crucial that development in the health IT field is coordinated to ensure interoperability.

Keywords: eHealth, mHealth, health information technology, ambulatory anaesthesia

Introduction

The World Health Organization's (WHO) definition of eHealth (a term also used by the National Department of Health, South Africa) is the use of information and communication technologies for health. Biomedical informatics is defined as "the interdisciplinary, scientific field that studies and pursues the effective uses of biomedical data, information and knowledge for scientific inquiry, problem solving, and decision-making motivated by efforts to improve human health."¹ The term "health information technology" (HIT) is used in the USA.²

The impact of HIT on quality and cost-effectiveness of care may be significant.³ In 2005, the World Health Assembly recognised the potential of eHealth "to improve quality, safety and access to care."⁴ A call for standardisation and interoperability is the most recent resolution passed by the World Health Assembly with regard to the WHO's eHealth programme.⁵ The National Department of Health of South Africa published the *National eHealth Strategy 2012-2016*.⁶ The integration of healthcare information management systems is crucial to coordinating patient care between service providers. To further standardisation and the integration of health data, the Minister of Health, Dr Aaron Motsoaledi, published a notice that he had approved the National Health Normative Standards Framework for Interoperability in eHealth, in April 2014.⁷

Possible applications of eHealth include electronic health records, registries and surveillance systems, consumer health informatics, health knowledge management, mHealth (the use of mobile technology in health), telemedicine and virtual healthcare, and the use of large volumes of information in health research.⁸ It is a legal requirement that information on patients is

stored and managed in a secure fashion, and that patient data is protected.

The international trend is towards convincing the public (patients) that the sharing of their health data through electronic health records is beneficial with regard to their own health, and plays a vital role in healthcare advances based on research from population-based de-identified information ("big data").⁸ Health facilities adopt HIT for organisational or operational financial benefits.⁹ Web-based technology and the identification of a core data set is essential to collecting information at national level.¹⁰

It is said that developing countries adopt new technology faster than developed countries because the regulation is less strict and the need is greater.¹¹ It is very possible that South Africa is such a developing country.

Information technology (IT) can be utilised in the ambulatory anaesthesia setting in the following ways.

Preoperative risk assessment and communication

A patient portal is an online website that allows patient access to personal health information.² It may also allow healthcare providers to engage with patients in a number of ways. An example would be that of a preoperative electronic health assessment questionnaire or screening tool. This tool can be used to identify patients at risk of unplanned admission and other complications after ambulatory surgery.¹²⁻¹⁶ The risk classification process may form part of an anaesthesia information management system (AIMS).¹⁷ Patients who are at risk can then be evaluated in a timely fashion to avoid day-of-surgery cancellations and to plan appropriate perioperative care, whether in the ambulatory setting or as an inpatient. However, it

is important that the information is accessible to a care provider who is in a position to direct the evaluation and planning.¹⁸ It is also important that a core data set is defined for preoperative evaluation.¹⁹

The patient portal can be used to initiate a link to further information on completion of a questionnaire or screening tool. This information may be about the anaesthesia provider, the anaesthesia practice contact details, general information pertaining to anaesthesia care, and information on anaesthesia billing practice; an application that can be categorised under consumer health informatics. This process should enable quicker patient understanding and the communication needed for the anaesthesia practice to obtain informed consent on anaesthesia procedures and billing from a patient.

Owing to the fragmentation of IT systems in South Africa, currently, it is difficult to access the comprehensive health records of a particular patient, but applications are available that may provide access to administrative data and clinical information, such as laboratory and radiological test results.

Intraoperative recordkeeping

The objective of the electronic health record (EHR) is the sharing of information contained in such a record to improve patient care. Electronic medical records (EMRs) contain data kept by a provider on a patient.² Mobile applications and mHealth software are available for the intraoperative capturing of clinical and billing data.

EHRs are made possible by (generally costly) hospital-based data management systems designed to capture intraoperative physiological data. These may incorporate AIMS, which is designed around the electronic anaesthesia record.^{20,21} AIMS has also been developed as a stand-alone system. Any such system, whether hospital wide or anaesthesia specific, may include clinical decision support systems²² and reminders to enhance, for example, a safe surgery checklist and antibiotic stewardship initiatives. Safer prescribing is also made possible by computerised physician order entry. The barcode identification of medication before it is drawn up enables feedback, decision support and documentation.¹⁷ It is important to identify and define intraoperative anaesthesia-related data elements that should be shared with other providers because they may impact on postoperative and future care.

Large retrospective studies that use AIMS data are now common. It is important to evaluate the impact of artefact in physiological monitoring in these studies.^{23,24}

It is easier to report on electronically captured data, and therefore to audit one's own practice. By recording key clinical data, such as adverse events or airway management factors electronically, the individual anaesthetist can more easily identify factors that would cause him or her to review and possibly adjust clinical practice for the benefit of patient care and safety. By submitting electronic health records to a registry,²⁵ surveillance (for example, of adverse events) can assist in hospital-based or even system-wide decision-making regarding processes of care.

mHealth technology plays a large role in enabling the capture of clinical information at the bedside. Web-based systems may require an Internet connection to ensure optimal functioning. Therefore, a wireless Internet connection at healthcare facilities would be of huge benefit. mHealth is also used for the dissemination of health knowledge, and numerous mobile application interface exist that enable easy access to educational material.

Postoperative outcome audits and benchmarking

There is a trend towards provider and institution comparison by consumers, funders and authorities of all kinds. It is important at individual and societal level that clinicians initiate and drive clinical governance and quality improvement, instead of allowing administrators and medical funders to do so.

Although a poor postoperative outcome can be multifactorial in nature, the integration of particular outcome data parameters with clinical anaesthesia information is a step towards personal practice audit and benchmarking. The integration of perioperative clinical data can be very challenging, particularly when an anaesthesia practice is not hospital based, as in the South African private healthcare sector. It may be easier to track outcomes in the day care setting.

Areas that need attention may be identified through facility-based monitoring of the perioperative care process.²⁶ For example, a healthcare facility could apply "triggers" in outcome data to identify areas in perioperative ambulatory care that require quality improvement. Such triggers could include global indices, such as admission to a hospital or length of stay (inappropriate in day cases), or specific triggers, such as venous thromboembolism or surgical site infection.²⁷ As the perioperative physician, the anaesthesiologist is in an excellent position to direct and advise on changes in clinical practice for the benefit of the patient.

The communication process with the patient who presents for ambulatory surgery could be concluded with an electronic patient satisfaction survey which empowers the patient, and which may lead to improved perceptions of anaesthesiologists as valuable and indispensable providers of quality health care.²⁸

Conclusion

There are a number of ways in which the individual ambulatory anaesthesia practitioner can utilise eHealth to improve his or her practice, but it is important to plan appropriately at health system level to create opportunities and ensure the interoperability of IT products. Despite efforts from regulatory authorities, significant change management may be needed to convince clinicians of the benefits of IT in anaesthesia, particularly with regard to workflow issues and time constraints.^{17,29} Without participation from clinicians, it may be futile to invest financially in hospital-based IT products. On the other hand, it is difficult for individual clinicians who are committed to keeping track of their practice electronically to integrate all of the perioperative clinical data on a case.

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