Chapter 1.6
IT Benefits in Healthcare Performance and Safety

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ABSTRACT

There is no doubt that carefully designed IT solutions enhance the capture of performance and critical incident reporting data in clinical environments. This chapter will examine the effectiveness of recent initiatives in this area and the value of the information that can be generated. While outlining the proposed savings to healthcare systems that can be anticipated by improved performance monitoring and incident reporting, the authors will also explore the additional value that the IT solutions can offer to clinicians in terms of improved learning experiences and ethical behaviour. Extensions of these applications will be discussed, with the necessary prerequisites (e.g. ease of data entry, single data entry/multiple data use, speed of data collection, rapid and accessible feedback of results, etc.) that underpin these advances. The potential barriers (e.g. technophobia, fear of performance monitoring, poor ethical standards) to successful uptake and implementation in healthcare are also considered.

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INTRODUCTION

The earliest work on accurately monitoring the success and failure of healthcare systems is attributed to Florence Nightingale and Lord Moynighan in the UK and Ernest Codman in the US. The pioneering of the professional role of nurses by Florence Nightingale in the 19th Century is well known, but her extension of healthcare analysis into the audit of hospitals is less well publicised. She worked with the British Home Secretary Lord Moynighan in producing these early audits, which, in the absence of computing power, were time consuming and extraordinary for their time (Chambler & Emery, 1997; Nuttall, 1983). Later, in the early 20th Century, a New England physician, Ernest Avery Codman, attempted a similar analysis by defining the "outputs" of a hospital and attempting to relate these to different practices. Again all of Codman's analyses were undertaken without the assistance of computers and represent a large number of calculations that can currently be undertaken by modern computers in fractions of a second. However his work was uniformly unpopular with his colleagues and he was ostracised by the local medical community

(Codman, 1914; Kaska & Weinstein, 1998). The importance of these early pioneers of audit and performance monitoring was that they assumed that individual and system performance could be measured and then optimized (Spiegelhalter, 1999). The tacit assumption that ensured their lasting unpopularity with the medical profession was that healthcare performance was not already perfect; or that system or individual error was occurring in the hospitals and health systems that they examined. Largely due to the work of these pioneers and the application of sophisticated computing programs and devices we now know much more about the frequency and cost of these adverse events in healthcare.

Errors in medicine are expensive, not only in terms of human life and the suffering they impose on patients, relatives and carers but also the financial burden that they impose on healthcare systems in the developed world (Kohn, Corrigan, & Donaldson, 1999; Lesar, Lomaestro, & Pohl, 1997; Michel, Quenon, de Sarasqueta, & Scemama, 2004; Vincent, Neale, & Woloshynowych, 2001; Wilson et al., 1995; Woods, 2000). Information about these episodes in complex healthcare delivery has only become widely available through the use of large computing and IT systems designed to collect clinical information. The most recent estimates indicate that this cost was $17-29 billion, in the US alone, in 2000 and may have contributed to between 48,000-98,000 deaths in the same period (Fenn, 2002; Kohn et al., 1999). Despite this human and financial cost, rates of adverse events do not appear to be falling, certainly in Australia and the US there is little evidence that adverse event rates are decreasing (Ehsani, Jackson, & Duckett, 2006; Wilson & Van Der Weyden, 2005).

Studies of adverse events have defined generic failings that have contributed to these identified errors (Thomas et al., 2000; Thomas et al., 2000; Wilson, Harrison, Gibberd, & Hamilton, 1999). Incident reporting in clinical medicine improves patient safety by reducing future errors. This occurs as incident reports lead to the identification of underlying generic and systemic errors and measures are put in place to prevent their recurrence (Barach & Small, 2000; Bolsin, Faunce, & Colson, 2005; Kraman & Hamm, 1999; Wolff, 1996; Wolff, Bourke, Campbell, & Leembruggen, 2001).

PERFORMANCE MONITORING

Monitoring the Performance of Healthcare Systems

The feedback of performance data to medical practitioners in healthcare has been demonstrated to improve the quality of measurable patient outcomes in several situations. Mark Chassin, as Head of Public Health in New York State, developed a comprehensive, compulsory IT-based programme for the collection and dissemination of risk-adjusted outcomes from cardiac surgery to all cardiac surgeons and hospitals undertaking cardiac surgery in New York State (Chassin, Hannan, & De Buono, 1996; Hannan, Kumar, Racz, Siu, & Chassin, 1994). Remarkably the use of the IT-enabled data collection and outcome feedback programme led to a 40% reduction in risk-adjusted mortality over a 3-year period (Hannan, Kilburn, Racz, Shields, & Chassin, 1994). Another voluntary cardiac surgery programme set up with similar goals also in the Northeast of the USA, and also employing sophisticated computing programs and enormous computing power, achieved almost identical results (O'Connor et al., 1996). This confirmed the value of measuring outcomes from complex interventions, adjusting for the patient's risk in the intervention and feeding back risk-adjusted outcomes in a sustained and systematic fashion. The importance of this work relates, in part, to the uniformity of the findings in a complex speciality of medicine (cardiac surgery), and the use of risk-adjustment to validate the process of data collection and feedback to

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