

# Chapter XXVI

## The Development and Implementation of Patient Safety Information System (PSIS)

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### ABSTRACT

*This chapter presents the overview of the current status and developmental stages of the PSIS technology and consensus around the patient safety issues as they emerge, grow, and mature globally. The first section gives the general description of the patient safety reporting system (PSRS), and then provides the brief summary of 23 patient safety information classifications and terminologies to date. In the next section, the development of the international classification of patient safety (ICPS) is overviewed, which evolved from the local to an international level by the joint initiatives of WHO. The essential elements of the PSIS and the clinical decision support system (CDSS) functionalities are explained to make the future goals of PSIS clearer. The patient safety indicator (PSI) is explained in a separate section, which provides the opportunity to assess the incidence of adverse events and in-hospital complications using administrative data found in the typical discharge record. The ultimate goals of PSIS and PSI are to improve the quality of healthcare and ensure patient safety.*

### INTRODUCTION

“To Err Is Human” report (Institute of Medicine, November 1999), brought to public’s attention the issue of patient safety, and alarmed the U.S. healthcare industry (Kohn, Corrigan, & Donaldson, 2000). It suggested that medical accidents

caused between 44,000 and 98,000 deaths annually in American hospitals, great majority of which were preventable. Subsequent studies from a number of other countries demonstrate that patient safety is clearly a problem on an international scale. (Baker et al., 2004; Vincent, Neale, & Woloshynowych, 2001).

The causes of these adverse events are often complex, as they can be attributed to combination of multiple compounded errors. For example, the hospital system includes testing, diagnosis, treatment, caring of the patients, control of commodities and apparatus management. This complexity often makes it difficult or impossible to determine the real causes of an individual accident (Dew et al., 2004). The “To Err Is Human” report emphasizes that most medical accidents are the result of system failures, and that the renovation of healthcare delivery system is crucial in order for it to operate safely. An ideal system must not only reduce the likelihood of errors, but also be sensitive to the occurrences. Worldwide concerns about safety in patient care have stressed the need to coordinate the monitoring, reporting, and understanding of adverse events and “near misses.” Clearly, better information on the number, types, severity, causes and consequences of adverse events is required to develop the strategies, which will reduce the risk of medical incidents and ameliorate the devastating effects of medical errors.

## **PATIENT SAFETY REPORTING SYSTEM**

There are many ways to improve patient safety using information technology (Bates & Gawande, 2003). One way of improving safety is improving detection and reporting systems for error and adverse event (IOM, 2003). In small studies, computerized reporting systems have been associated with an increased rate of spontaneous reporting (Dixon, Wielgosz, & Pires, 2002). Computerized reporting streamlines subsequent evaluation by making it easier to perform analyses and categorize reports in different ways. One university hospital treating more than 25,000 patients annually reported a feasibility study of a computerized voluntary based medical error reporting system in the ambulatory setting (Plews-Ogan et al., 2004). The findings showed that the voluntary

based medical error reporting system resulted in a 20-fold increased reporting rate, and physicians reported many of these errors. Also the study suggested that new medical error reporting systems should combine reporting with analytic functions to facilitate analysis. A study by Furakawa et al from Japan found that a computerized medical error reporting system was effective and acceptable to providers, and facilitated analysis (Furukawa, Bunko, Tsuchiya, & Miyamoto, 2003). In another study, a web-based reporting system was developed and implemented for medical workers of 54 hospitals who were working in neonatal intensive care units (Suresh et al., 2004). This system was both voluntary and anonymous. Evaluation of the feasibility and utility of this approach revealed that it was well received, and effective for identifying a wide variety of medical errors. In addition, the approach facilitated cooperative, multidisciplinary studies.

In developing a medical error reporting system, the key factors to consider are objectives of the system, challenges associated with such objectives, classification system, reporting process, and how the errors will be analyzed (Beasley, Escoto, & Karsh, 2004). In addition, systems should ideally be non-punitive, and voluntary to the greatest extent possible and with certain exceptions.

In America, the medical community is currently struggling toward implementing medical error reporting and prevention systems. Reporting systems are required in hospitals by the Joint Commission on Accreditation of Healthcare Organization (JCAHO), which in particular mandates that sentinel events be reported. Sentinel events are particularly serious adverse events. Beginning in 1995, nationwide sentinel event cases have been collected by JCAHO, although a number of other reporting systems predated this one. In the sentinel event database, the annual number of reports continues to increase with time, but most believe that the reported cases are only tip of an iceberg. The sentinel event structure is useful for the most serious adverse events; for errors and

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