

Executive Summary

Intelligent infusion devices (a.k.a., “smart pumps”) could carry potential patient safety improvements. In 2005, The Academy C-suite leaders estimated that smart pumps would have a significant impact on patient safety and staff efficiency (Figure 1). The reality has proved far more challenging.

CNOs and CMOs of The Health Management Academy requested and participated in a research study to better understand how the leading health systems have developed a strategy, evaluated devices, made purchase decisions, managed the implementation process, and derived measurable results from smart pumps.

This study found a direct link between the organizational structure driving smart pump initiatives, the adoption of advanced devices, and reduced medication errors.

- 37% of health systems reported *significant improvement* in medication errors as a *direct result* of their smart pump implementation (Figure 2).
- Systems that reduced medication errors had more advanced smart pumps than those that reported no improvement (Figure 3).
- A corporate organizational approach was most likely to result in reduced medication errors via advanced smart pump adoption and standardization (Tables 1 & 2). These practices were also more likely to be utilized by those health systems which reported significant improvement in medication errors (i.e., the “*Top Improvers*”)

Figure 1. 2005 C-Suite Views on Technology Potential

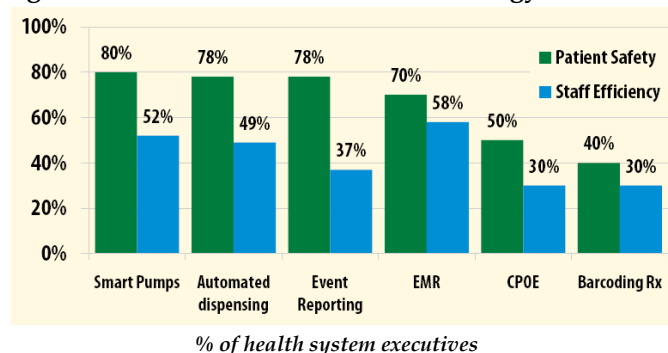


Figure 2. Verified Outcomes of Smart Pumps

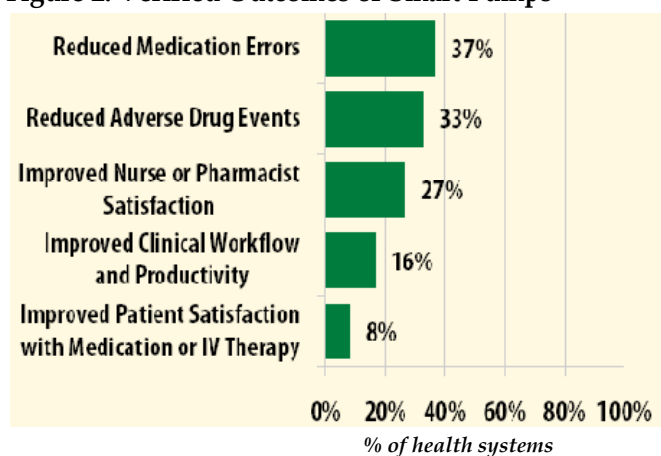
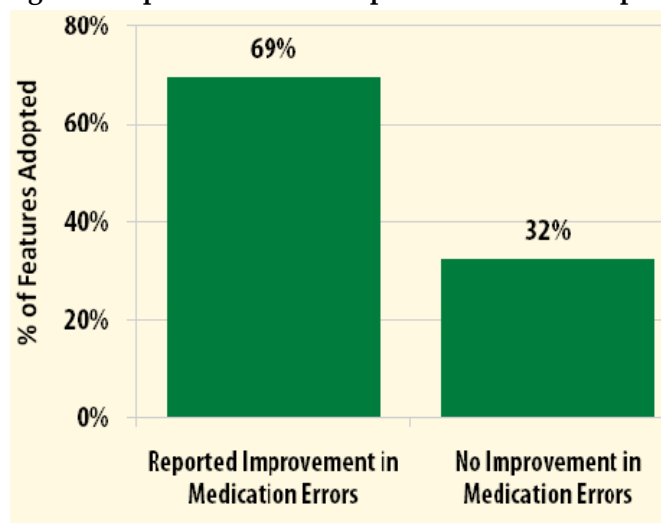


Figure 3. Improvers Vs. Non-Improvers: Features Adopted



For more information, contact Paul Clark, Senior Director of Research, at paul@hmacademy.com

Characteristics of the Top Improvers

Nearly all "Top Improvers" - Health systems that reported the greatest reductions in medication errors -- had a multi-pronged, system-level strategic plan (Table 1).

Table 1. Top Improvers' Strategic Approach

System Strategic Plan for IV Therapy	
• Patient Safety	• Purchase Decision
• Quality Improvement	• Device Implementation
• Standardization	• Device Maintenance

Health systems reporting the greatest reduction in medication errors were significantly different in several organizational practices. Purchase decisions were made at the system-level, implementation was planned and coordinated across the system, and the top improvers were more likely to achieve complete device standardization (Table 2).

Table 2. Practices of the Top Improvers

ORGANIZATIONAL PRACTICES	% of Top Improvers
PURCHASE DECISION	
Purchase decision made at the health system	83%
Purchase decision made by individual hospitals	0%
IMPLEMENTATION	
Implementation planned and coordinated at the health system	44%
Implementation planned and coordinated at individual hospitals	22%
STANDARDIZATION	
Complete device standardization: Same device and DERS; all units, all hospitals	44%
No Standardization: Different Infusion pumps used within the same hospital	0%

This study comes during extraordinary times. Providers are undergoing mass installations of electronic medical records (EMR) to receive incentives under the HITECH Act. The Food and Drug Administration (FDA) has launched an unprecedented safety initiative and forced recall of infusion devices.

As health systems adopted smart pumps, new complexities and challenges emerged:

- New safety problems (e.g., bypassing alerts);
- Awareness of the smart pump feature set;
- Interoperability;
- Updating drug libraries – even wireless enabled pumps may require manual updates;
- Tracking the location of the smart pumps;
- Productivity and clinical workflow –added complexity may make medication administration tasks *more* difficult for nurses;
- Reporting quality data in a user-friendly and effective fashion, and;
- Building a quality improvement infrastructure to act on any reports.

Achieving success requires significant organizational efforts in strategy, implementation, and ongoing quality management and maintenance

The Bottom Line

The bottom line from this study – health systems with a strategic corporate approach to implementing smart pumps adopted and utilized the most advanced feature sets and experienced the largest reductions in medication errors.