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### **Innovative IT solutions to improve patient safety**

- Computerized physician order entry (CPOE) with clinical decision support (CDS)
  - Default dosing: proportions of doses exceeding recommended maximum decreased by 71%.<sup>1</sup>
  - Renal dosing: Appropriate dosing improved by 24% and appropriate frequency improved by 69%.<sup>2</sup>
  - Antibiotic advisor: Orders for which patients were allergic decreased by 76%, antibiotic susceptibility mismatch decreased by 94%, and ADEs caused by anti-infective agents decreased by 86%.<sup>3</sup>
  - Pediatric dosing decision support: only 32% of dosing suggestions are accepted.<sup>4</sup>
- Smart pumps: 77% decrease in errors per 1,000 doses<sup>5</sup>
- Ambulatory result manager applications
- Bar-coding: 86-97% reduction in potentially harmful medication errors<sup>6</sup>; net benefit from bar coding after 5 years of 3.49 million<sup>7</sup>
- Automated drug delivery systems
- Robots

### **Return on investment of IT**

- Brigham and Women's Hospital (BWH) CPOE: BWH had \$28.5 million in net savings over 10 years. Largest savings driven by renal dosing guidance, nurse time utilization, specific or expensive drug guidance and adverse drug event prevention.<sup>8</sup>
- HIT and HIE nation-wide in the U.S. would save \$77-78 billion per year after implementation.<sup>9, 10</sup>

### **Areas of future research**

- Financial return on investment and cost effectiveness analyses for HIT and HIE
- Unintended consequences, qualitative and quantitative descriptions
- Effects of vendor-based systems on medication safety
- Effects of electronic prescribing systems in the ambulatory setting on medication safety
- Certification standards
  - More detailed standards for medication decision support
- Privacy and security solutions for HIE
- Optimizing pediatric decision support, particularly weight-based dosing

## References

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