

Evaluation of a Smart Labeling System and its Impact on Charge Capture and Medication Errors

Razi Rahman MD; James Joseph Thomas, MD; Brinton JT PHD, Patrick Guffey, MD. - Children's Hospital Colorado (CHCO)



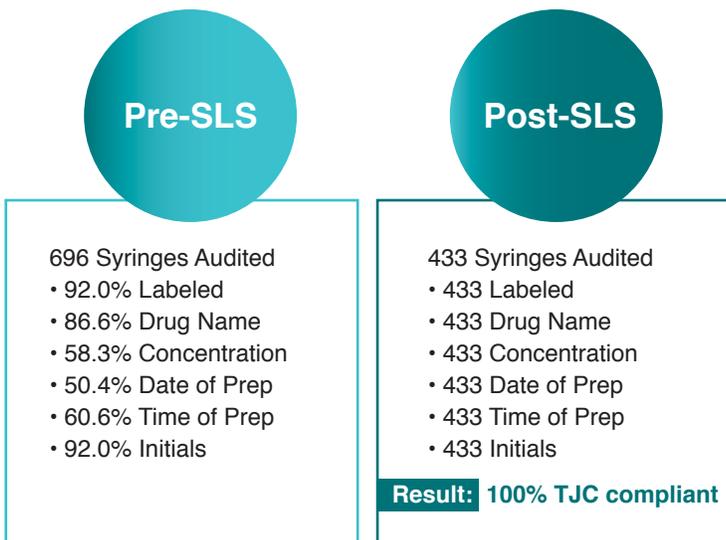
Background

- Medication errors (ME) continue to be problematic in healthcare. Labeling errors are the most common ME occurring 24.2% of the time.¹
- Perioperative ME rates have been reported as high as 1 per 20 cases and have been attributed to the medication management system and safety checks.
- Codonics Safe Label System (SLS) 500i is a labeling solution that claims to improve patient safety and labeling compliance.

Objectives

1. To improve labeling compliance in operating rooms (OR).
2. To improve charge capture of medications administered intraoperatively.
3. To improve workflow user satisfaction.

Figure 1: Labeling compliance pre-SLS and post-SLS



Conclusions:

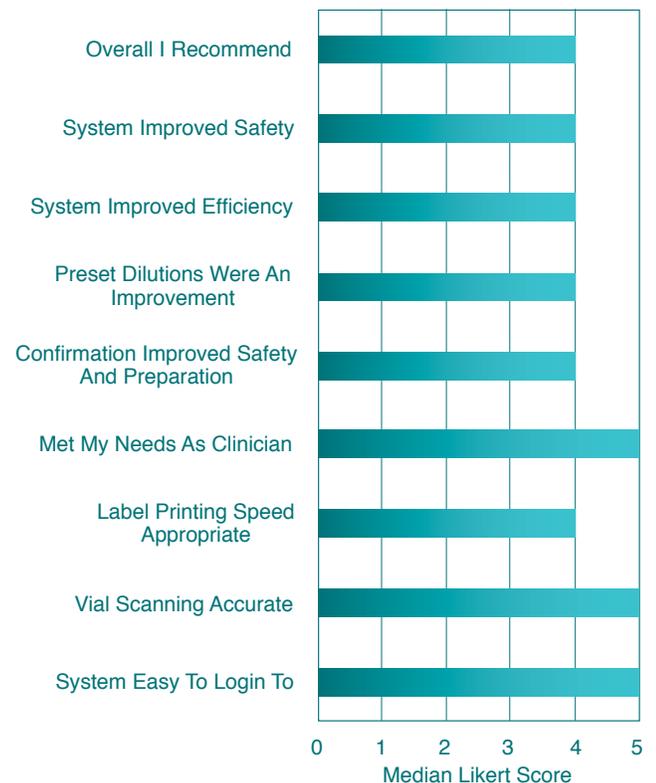
This research project demonstrates how implementation of a SLS can increase labeling compliance, increase charge capture and increase user satisfaction.

Potential limitations of our study

1. Our results come from specific ORs in a single hospital.
2. Seasonal and secular effects could not be captured in 9 months.



Figure 2: Post SLS Satisfaction Survey (5 indicating highest agreement)

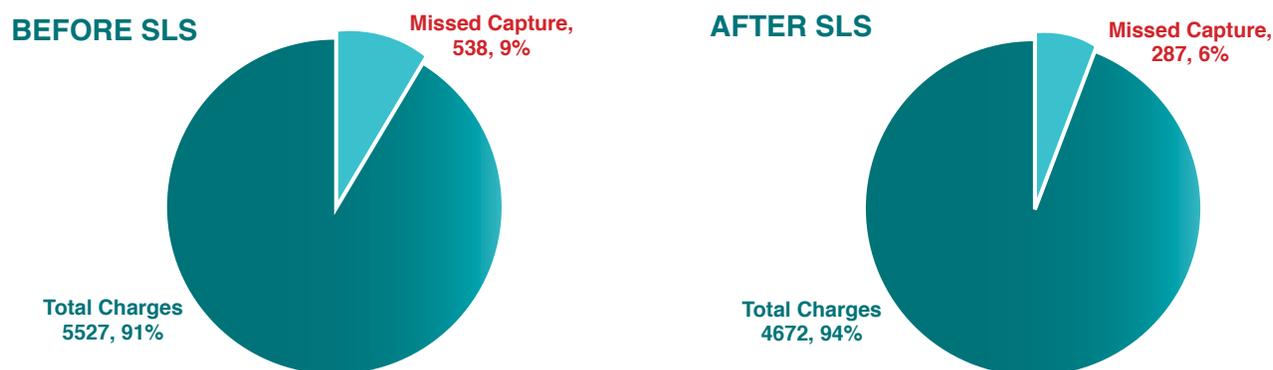


Over \$380,000 annual savings with Codonics SLS

Results: There were 1,014 patients in the pre-Codonics group and 958 patients in the post-Codonics group. Implementation of Codonics SLS improved charge capture by 3.62%. This improvement is statistically significant (z-score 6.66, p-value <0.05). A charge capture improvement of \$26,774 and revenue realization of \$9,639 were observed. These values were extrapolated to a potential annual savings of \$384,172 per 30,000 patients.

Figure 3: Charge capture before and after SLS

Before implementing the SLS, the average daily rate of missed charges was 9.7% (538 of total 5527) resulting in an estimated cost of \$8,098.97 per month to the pharmacy. After implementing the SLS, the average daily rate of missed charges was 6.1% (287 of 4672) resulting in an estimated cost of \$640.22 per month cost total to the pharmacy. – Study done with SLS in 4 ORs over 4 months



Methods

- Colorado Medical Internal Review Board, IRS exempt, single center, prospective cohort study.
- During the months Nov-Dec, we audited a cohort of ORs to evaluate baseline compliance of syringes containing medication with each of the Joint Commission (TJC) label elements, our primary dependent variable.
- During this time, the EMR was audited to assess what medications were administered in comparison to what medications were charged to establish a baseline charge capture rate, our secondary dependent variable. We implemented our SLS intervention in Jan-Apr 2016 and the ORs were audited again post intervention for labeling compliance and charge capture rate from Apr-Jul 2016.
- Afterward, an anonymous user satisfaction survey was to providers to determine our third dependent variable, user satisfaction.

Statistical Analysis

Frequencies were calculated for categorical outcomes and presented with Wilson 95% confidence intervals. Chi square test was used to compare the rate of missed labels between time periods. A two tailed unpaired T test was used to analyze the difference between two population proportions. Descriptive statistics were also utilized.

Future Directions

Follow up in multiple different hospitals over longer periods could improve validity by limiting these biases. More research is needed to evaluate the clinical impact of SLS in reducing medical errors.



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17991 Englewood Drive
Middleburg Heights, OH 44130 USA
+1.440.243.1198
+1.440.243.1334 Fax
Email info@codonics.com
www.codonics.com