# Using Barcode Technology to Decrease Specimen Mislabeling Errors

**Anne Brogan, MSN, RN, Denise Goldsmith, MS, MPH, RN, FAAN**

*Brigham and Women's Hospital, Boston, MA*

## Introduction/Background

Mislabeled specimen errors can lead to serious problems since many health care decisions are based on laboratory results. In May 2015 Brigham and Women's Hospital (BWH) implemented a vendor-based standalone specimen collection product, interfaced to the Electronic Health Record (EHR), to positively identify the right patient to the right specimen order. This product used bar code technology as an intervention to reduce specimen labeling errors. The new process would insure compliance with The Joint Commission's Patient Safety goals: *(Joint Commission, National Patient Safety Goals, 2015).*

## Methods

Collaboration between Nursing Informatics and laboratory and IT colleagues was initiated to develop a positive patient identification laboratory specimen collection workflow. The stand-alone vendor product and the existing EHR were leveraged to accomplish this task. Functional and workflow requirements were identified. Patient- and specimen-specific labels generated from the system were configured to allow nurses to use barcode technology to positively identify the patient and the correct ordered specimen at the point of care. An electronic usage report was developed and distributed four to five times per week to the nurse educators for follow up on a unit level. The report is a tool which supplies details about all specimens collected and facilitates identification of when the system was not successfully used. Nurses were engaged at all levels of the organization to identify obstacles and report problems with the newly implemented process of using positive patient and specimen identification.

## Results

Baseline mislabeling rate data was collected monthly from August to October 2014 and showed an error rate from 0.23 to 0.32 (avg 0.27): (Melanson, et al., 2016). Post implementation mislabeling rate data was collected from August to October 2015 and demonstrated an error rate of 0.17 to 0.08 (avg 0.10) which was a 63% reduction. The total number of known mislabeled specimens was also reduced from 72 in 2014 to 23 in the same three month span in 2015. This represented a 68% decrease in total labeling errors.

It was also notable that 21 out of the 23 errors identified in 2015 occurred when the stand-alone product was not used successfully. Frequent distribution of the usage report and the subsequent attention paid to the product functionality contributed to an improved "successful usage" rate. At the time of the 2015 data collection the success rate in using the stand-alone process was approximately 75%. Within 5 months of distribution of the usage report the "successful usage" rate of the stand-alone product increased to 90%. With the increase in the successful use of the stand-alone specimen collection product the mislabeling error rate significantly decreased to an average of 0.02 for a three month period.

## Conclusions and Recommendations

Collaboration between nursing informatics professionals and bedside clinical nurses, along with colleagues from the laboratory and IS resulted in the reduction of a significant safety issue for our patients. Leveraging our EHR along with an interfaced standalone product, we were able to implement the use of bar code technology to effectively reduce specimen mislabeling errors.

## References

**1.** Le, Rachel D, Melanson, Stacy MD, PhD, Petrides, Athena k., Goonan, Ellen M. MS, MT (ASCP) SH, RN, et al.(2016). Significant Reduction in Preanalytical Errors for Nonphlebotomy Blood Draws After Implementation of a Novel Integrated Specimen Collection Module. American Journal of Clinical Pathology 2016; 146:456-461.

**2.** The Joint Commission. 2015 National Patient Safety Goal.