

Improving Laboratory Result Reporting Accuracy

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ABSTRACT

Result reporting accuracy is paramount to quality laboratory services.

In 2010, CCHMC Laboratories had an error rate of 14.1/10,000 tests compared to the CAP National Pediatric Benchmark of 4.6/ 10,000 tests.

Use of LEAN methods lead to the following initiatives: implementation of multiple instrument interfaces, new test platforms, decision support, manual test result entry process changes, auto verification for high-volume high-risk systems, enhanced staff communications, and hospital-wide Positive patient identification system (PPID).

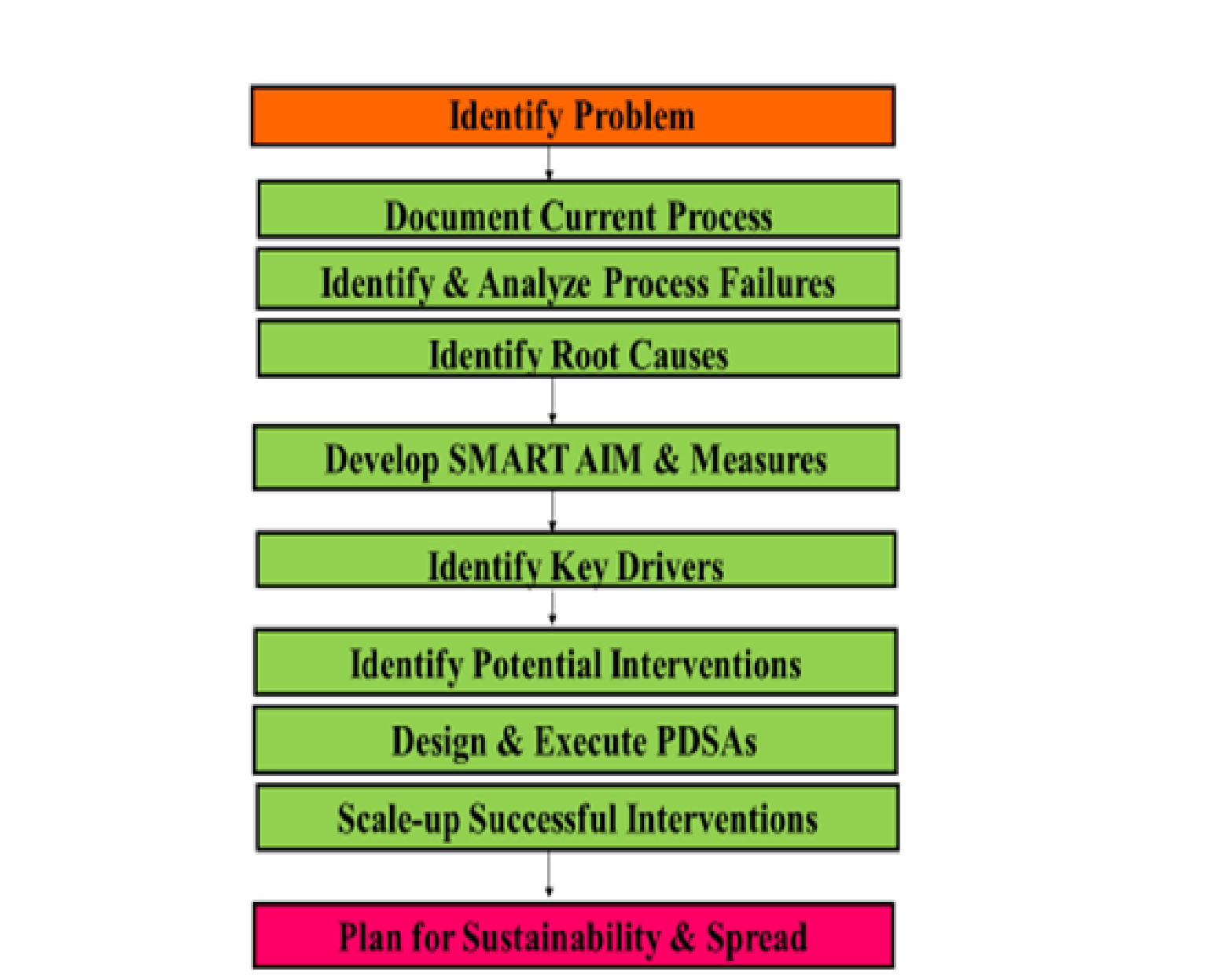
During this 6 year period, CCHMC reduced errors from 14.1 to 0.9 per 10,000 reported results and surpassed the National Pediatric Benchmark every year since 2014.

INTRODUCTION

In efforts to exceed health care quality expectations of patients, providers, accrediting bodies, and payers, Cincinnati Children's Hospital (CCHMC) needed to find consistent, sustainable process changes to reduce the high number of reported result errors. Result errors potentially delay patient treatment or lead to unnecessary procedures, thus adding to the cost of care and reducing patient satisfaction.

In line with a growing 'Lean' culture at CCHMC, a concept most commonly seen in industrial manufacturing, the Clinical Laboratory took the initiative to learn new lean concepts through hospital quality improvement projects, learnings from Toyota's successful lean culture, while endlessly seeking to promote a continuous culture of improvement. (Figure 4)

Figure 4- Project Road Map



Acknowledgments

Special Thanks to go to our Team Sponsor- Sally May, Team Coach- Jim Brown, Team Members- Annette Lakes, Rae Wallace, Bryan Kastl, Diana Howard and our staff- the champions of this process change.

Figure 1- Clinical Lab Result Reporting Errors

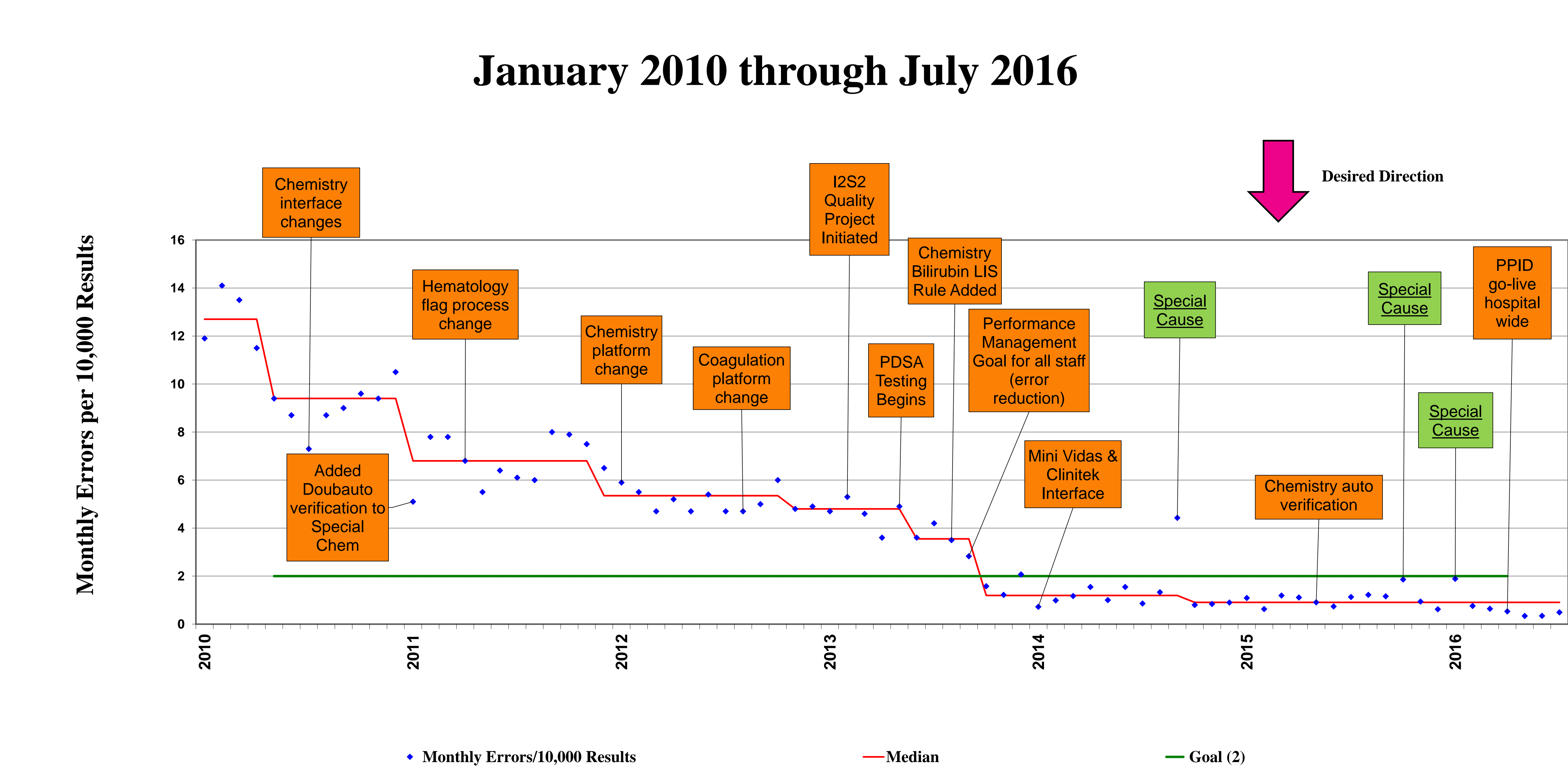


Figure 2- Lab Result Reporting Errors

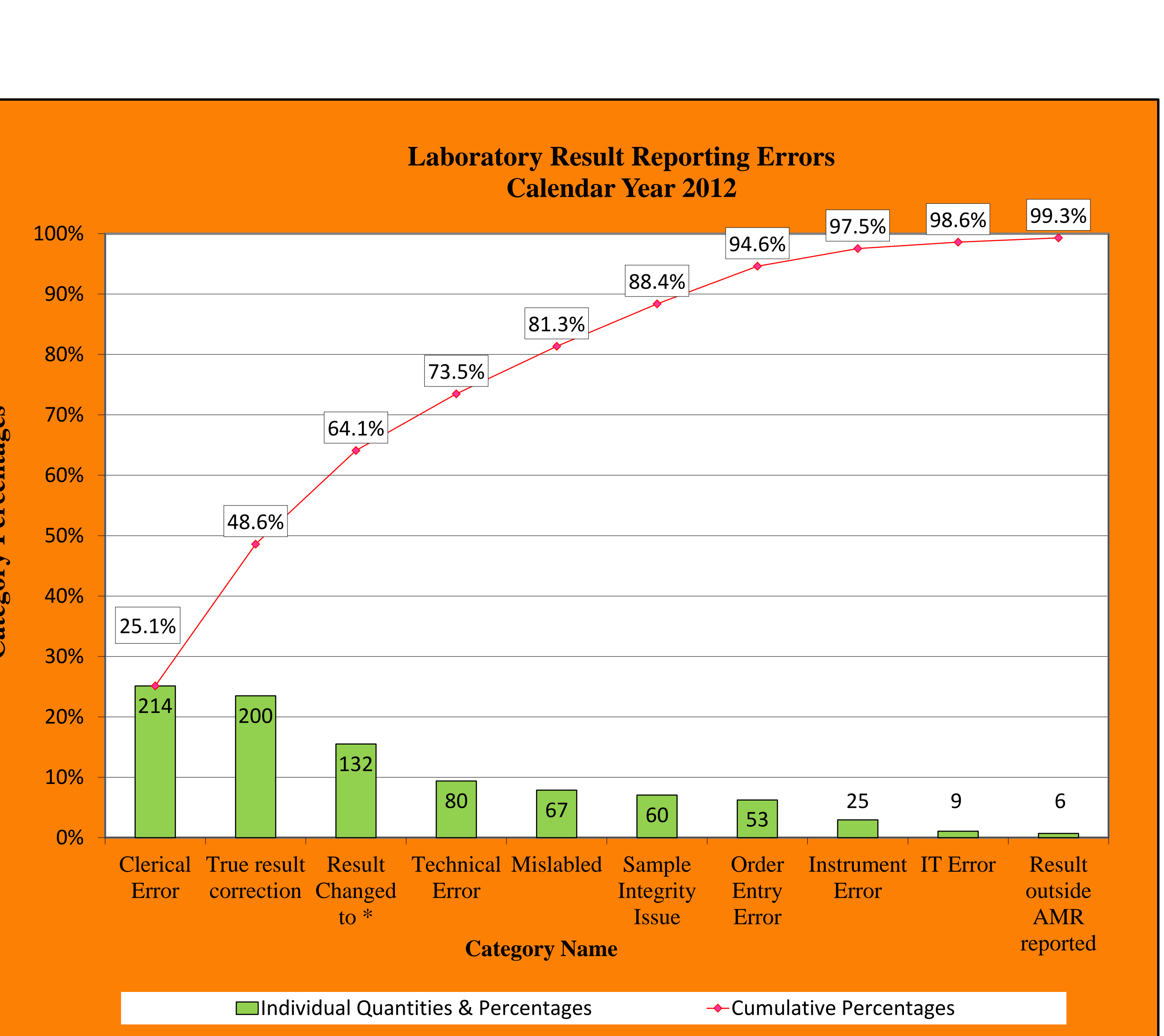
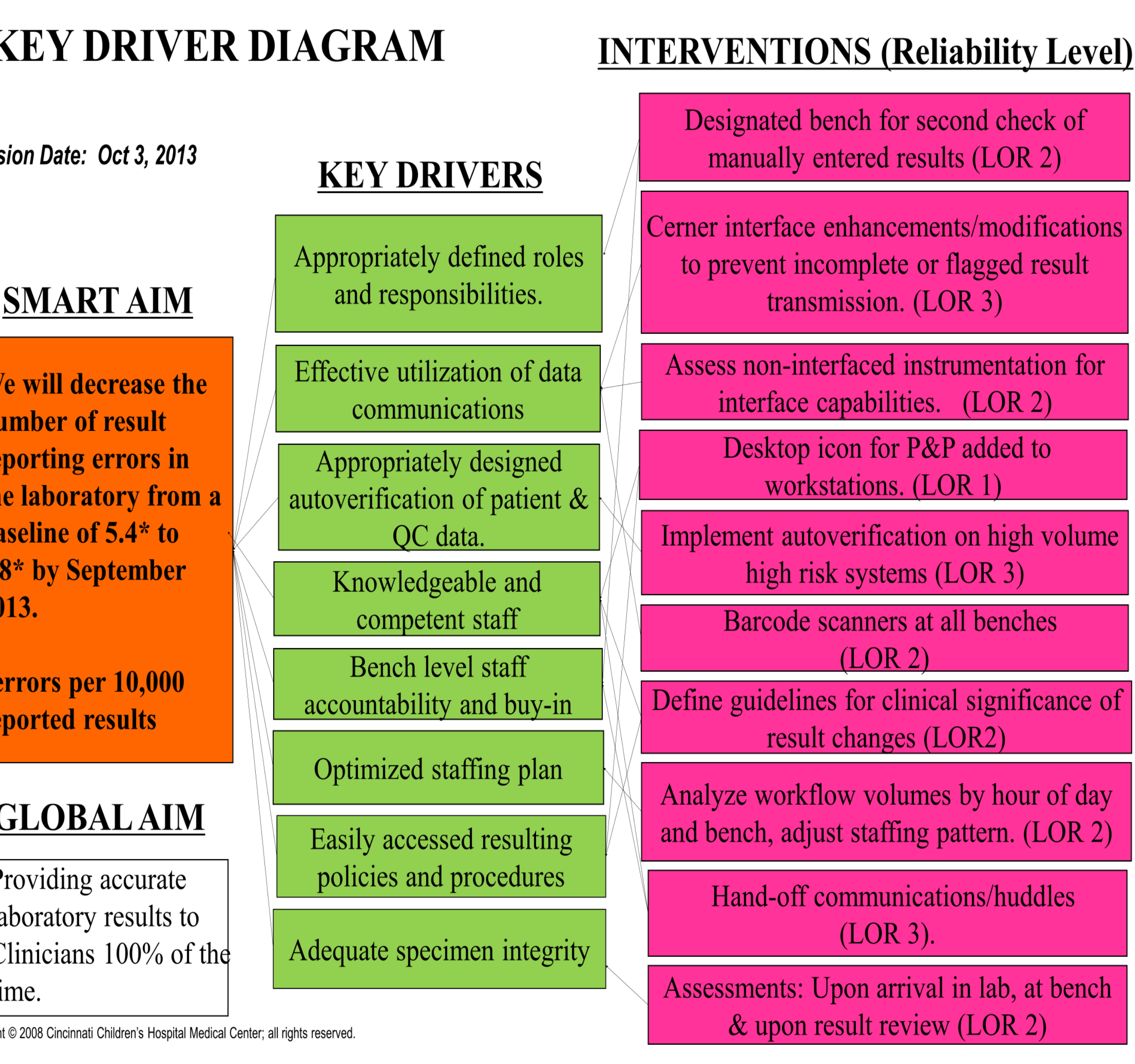


Figure 3- Key Driver Diagram



MATERIALS & METHODS

- 🚩 **CAP Q-Tracks** CCHMC submitted data through the Q-Tracks (QT16) *Corrected Results* program to compare the error rate to other facilities to understand their current status in the healthcare industry.
- 🚩 **PROCESS MAP** Each step of the current process flow was mapped out. This was compared to the expected process which helped identify duplicate, unnecessary, incorrect steps, or steps that may have been modified from the original process.
- 🚩 **FAILURE MODES EFFECTS ANALYSIS (FMEA)** Through review of baseline data, it was determined that most errors occurred in the post-analytical phase. Steps of the test resulting phase were identified along with the common failures that had potential opportunity to result in an error. Interventions were identified through brainstorming.
- 🚩 **PARETO CHART (Figure 2)** This chart was used to identify what errors had the highest rate of occurrence.
- 🚩 **KEY DRIVER DIAGRAM (Figure 3)** This is the heart of the project where the Global and Smart Aim of the project were identified. Essential key drivers were defined and interventions that could significantly impact these key drivers were given a score based on levels of reliability for healthcare (LOR 1-3).
- 🚩 **PLAN, DO, STUDY, ACT (PDSA)** 4 tests of change were identified. Based on learnings, impact and test outcome, these processes were adapted, adopted or abandoned.

RESULTS/CONCLUSION(Figure 1)

- 🚩 4 PDSA ramps were tested, 10 total tests, 3 Adapts, 6 Adopts, 1 Abandon.
 - 🚩 Over the course of 6 years The Median line was lowered 7 times.
 - 🚩 8 major enhancements included the addition of the following: Automation, LIS result flags, test platform changes, auto-verification and Patient personal identification system
- After the collection and reporting of our data of 14.1 errors per 10,000 results, the median line started at 12.7 with a continuous decrease in reporting errors to 0.9 errors per 10,000 reported results. Not only did these changes significantly reduce the number of test entry errors, they proved to:
- 🚩 Reduce work flow barriers
 - 🚩 Streamlined specimen result reporting process
 - 🚩 Reduce opportunities for human error
 - 🚩 Increase staff awareness
 - 🚩 Increase physician/patient/family satisfaction
 - 🚩 Result in an overall safer patient experience

The CAP Median line is currently 3.5 errors per 10,000 reportable results Cincinnati Children's Hospital Clinical Laboratory continues to track and monitor these errors with a focus on prevention and preoccupation with failure.