10-2019

Assessment and Improvement of Data Collection Errors Through Inter-departmental Collaboration

Charlott Williams
Children's Mercy Hospital

Kelli L. Behr
Children's Mercy Hospital

Mary Moffatt
Children's Mercy Hospital

Rangaraj Selvarangan
Children's Mercy Hospital

Assessment and Improvement of Data Collection Errors through Inter-departmental Collaboration

Charlott Williams, RN, BSN, CCRC and Kelli L Behr, Data Analyst, Mary Moffatt, MD and Rangaraj Selvarangan, PhD

Children's Mercy Kansas City

BACKGROUND and PROBLEM

The Pathology and Laboratory Medicine (PLM), Emergency Medicine (ED) and Infectious Diseases (ID) departments work collaboratively on the CDC's New Vaccine Surveillance Network (NVSN) multi-year Acute Respiratory Infection (ARI) study. The ED team enrolls over 800 subjects for this project annually. PLM study coordinators oversee data accuracy by reviewing all 625 data points on ED study forms, which when combined with the number of subjects enrolled annually amounts to over a half million opportunities to make an error.

Rate of error is calculated by dividing the total number of actual errors by the total number of potential errors (Figure 1). Additionally, error rates are also calculated for each individual ED team member.

Figure 1: ED Enrollment & Errors - 2016/17 Season

The ED team's error rate increased over the course of the 2016/17 study season as attention drawn to these errors caused a disproportionate amount of stress, but the overall error rate was still only 0.4% by the end of the season. Additionally, two of the predefined errors are protocol deviations, or "reportable events" by the CMH Institutional Review Board.

Analysis revealed problems with the quality assurance process, which allowed common, easily correctable mistakes to continue:

- no identification or review of common errors
- confusion and stress over individual error rates
- no opportunity for ED team input on the improvement and correction process

SPECIFIC AIMS

1) To maintain the ED team's high rate of accuracy in data collection
2) To begin team participation in corrective action planning
3) To improve interdepartmental problem solving

METHODS

Beginning in January of 2018 (2 months into 2018/19 season), error reports were analyzed to determine the top five most common errors. Specific errors were then grouped into five categories by the type of error, with examples of each below:

- **Contact Sheet Errors**
  - Secondary contact field not marked
- **E-Consent Documentation Errors**
  - Child's first and last name reversed on form
- **Interview Errors**
  - Required interview questions missing
- **Research Note Errors (Documentation of Consent)**
  - Consent timestamp same or prior to conversation
  - Mandatory Research Note missing from Cerner
- **Screening Log Errors**
  - Missing exclusion criteria on screening log

INTERVENTIONS

- Transition from paper to electronic data collection (Figure 2)
- Quarterly identification and review of the most common errors made by the ED team, rather than by individuals
- Secondary analysis by error category allowing for evaluation of trends over time (Figure 3)
- Ongoing ED team-based review and corrective action planning for common errors

The team began reviewing the list of errors in aggregated form, changing the focus from who committed the error to its root cause, and what actions would reduce it going forward.

Figure 2. Examples of Improvement with Electronic Data Capture

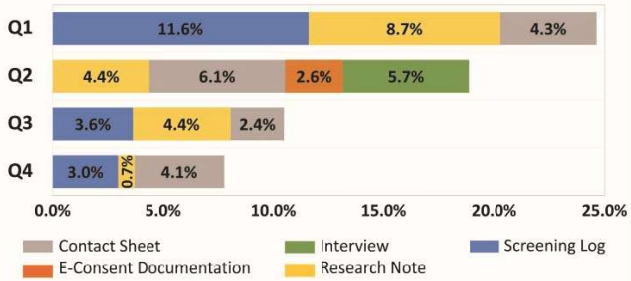
Potential Errors	Potential Errors			
Document	**Pre-Intervention**	**Post-Intervention**	**Difference**	**Reduction**
Consent Form	56	37	-19	34%
Contact Sheet	89	29	-60	67%
Enrollment Log	n/a	16	+16	n/a
Interview Form	378	65	-313	83%
Research Note	19	19	0	0%
Screening Log	83	50	-33	40%
Total	**625**	**216**	**-409**	**65%**

RESULTS

The greatest impact realized was elimination of 409 potential errors (per enrolled subject) by switching from paper data collection to electronic including auto-population techniques, either pulling data from the medical record or by duplicating repeated fields commonly susceptible to typographical errors; this action essentially eliminated all errors in the research note. Implementing safeguards for verifying information determining subject eligibility assured the two protocol deviations were not repeated.

By the end of 2018, the overall error rate (calculated under the previous method) was reduced to 0.32%, in spite of possible errors going down by 65% of the original potential (Figure 2). Being able to actively participate in the corrective action process also improved inter-departmental relations and reduced stress within the ED Team.

Figure 3. Overall Error Trend* by Type & Quarter 2018



* *Error rates were calculated by the number of times a specific error was made divided by the number of subjects enrolled, quarterly.*

CONCLUSION

Open communication about errors, between all collaborating departments, combined with a shared approach to solving them:

- improved morale and perception of error tracking by the team
- led to a decrease in errors overall, and
- increased inter-departmental collaboration.

When all members of the inter-departmental team work together with a positive approach to corrective action, improvement in error rates is a natural outcome of the solutions devised.