QUALITY IMPROVEMENT
PROJECT COMPLETION DOCUMENT

IMPACT
Describe the EVALUATION of the outcomes of the project as they relate to the project's aim and deliverables.

Proper blood sample collection has been the target of multiple nursing educational initiatives. Over the month of March 2015 we held multiple huddles/nursing education sessions at both ED sites to improve blood culture collection. On January 21, 2016 we implemented a new force-function in EPR that automatically prints out labels for two sets of blood cultures, eliminating the need to have each set ordered individually.

With the help of UHN Decision Support, we collected data on blood cultures sent to the lab for each patient presenting to the ED and ultimately discharged home from December 2014 to March 2016. This timeline will cover both pre and post initiation of interventions in order to evaluate the interventions that have been implemented to decrease the rates of single sets. So far we have analyzed the most recent available data (up to March 31, 2016), and we will continue to monitor the rates of improper sampling.

Our primary outcome was to assess the rate of single sets being sent to the lab for analysis. A single set was defined as only one aerobic and anaerobic bottle sent for the patient encounter in a 4-hour window. This window was used to account for instances where a single set of cultures was sent initially, and a second set was added on at a later time after physician assessment.

MILESTONES
Describe the various MILESTONES delineated in your project charter and when/how they were achieved.

This project aimed to improve the reliability of blood cultures drawn in the ED by eliminating instances where a single set of blood cultures is sent to the lab for analysis.

Using run chart analysis techniques, it appears that the education sessions did not produce any significant changes in the rates of single sets being sent to the lab at the TGH ED (appendix A). A modest improvement was seen at the TWH ED (appendix B) that was sustained over time.

Without achieving the desired reduction in single sets, the EPR changes were rolled out. Though the data post-implementation is limited thus far, it shows a clear and statistically significant reduction in the number of single sets sent to the lab at both TGH (appendix C) and TWH (appendix D). The median rate of single sets after the education sessions, but before the EPR rollout, was 33% and 27% at TGH and TWH, respectively. After the EPR rollout, the rates dropped to 15% and 6.5% at the TGH and TWH sites (see table 1 for a summary). Whether this decrease is sustained over time remains to be seen with ongoing analyses.

LESSONS
Describe the LESSONS, individual or organizational, learned through this project.

It is evident that despite rigorous training and reminders, blood cultures continue to be collected incorrectly. The reason for this remains unclear however this may be secondary to the technical and time consuming nature of this procedure. Comparing the educational initiatives and the implementation of the EPR force-function it became clear that cognitive forcing strategies are much more effective at changing practice and provider habits than educational initiatives.

In order to reduce the rate of single culture sets, hospital departments should consider implementing a cognitive forcing strategy such as printing 4 culture labels simultaneously as the default as a reminder to healthcare providers to collect 2 sets of cultures.

RECOMMENDATIONS

Describe the IMPLICATIONS of this project for patient care or for future projects.

Sending a single blood culture for analysis is problematic for several reasons. A solitary blood culture is difficult to interpret, especially in situations where the organism isolated is also a common skin contaminant. When this occurs, repeat cultures are drawn to either confirm or refute the first result, leading to wasted resources (the first set of cultures, giving empiric antibiotics) and time (for the patient and clinicians).

On the other hand, in certain patient groups with high risk for bacteremia, common skin contaminants may represent a true infection. In this case, not having the second set delays a definitive diagnosis, putting patient safety at risk while the repeat cultures are being incubated to confirm the first result.

The results of this project may indicate further opportunities for improvement in other common clinical processes and procedures to reduce waste and mitigate risk, while improving ED patient outcomes.

DISSEMINATION

Describe the completed or planned steps for DISSEMINATION of this project's findings (e.g., presentations, posters, manuscripts, etc).

It is clear that the cognitive forcing strategy was effective in reducing the rate of single cultures. It is likely that these changes will not only help to reduce cost associated with the unnecessary follow-up of false positive culture results but most importantly will play a role in improving ED patient outcomes. Furthermore, there does not appear to be a large body of data focused at addressing these issues– especially in the ED setting. As a result, our group will also be looking into submitting this for publication as well as presenting this as a poster at EM conferences (i.e. CAEP). It is likely that similar challenges are being faced in Emergency Departments across the country and we look forward to sharing our experience in order to help facilitate and improve the blood culture collection and follow-up process.

The results of this project also reinforces the effectiveness of forcing functions. Caution must be taken not to be overzealous in application of this technique, as it may have unintended and unwanted consequences (e.g. workarounds, alarm fatigue, decreased vigilance). However, smart usage of forcing functions can clearly improve performance and decrease standardization.