Reducing unnecessary blood-testing in the Emergency Department: the use of Quality Improvement science with laboratory data to address clinical problems.

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Introduction

The NHS 2020 Vision identified Unscheduled Emergency Care as a priority area for improvement. Of laboratory requests from our Emergency Department (ED), around 15 are rejected each week as unsuitable. This equates to just less than 1,0000 patients each year for whom there may be a delay in management or discharge.

We wanted to reduce the number of rejected samples from ED. This work is strategically aligned with improving national ED waiting time targets and laboratory test demand optimisation.

Anecdotal evidence in our emergency department (ED) suggests that many coagulation and glucose blood tests are requested unnecessarily. There are implications for over diagnosis, increased financial cost and delayed discharge.

By reducing wasteful or harmful variation in processes, we hoped to improve the effectiveness of the service provided to patients and we wanted to explore collaborative approaches to reduce variation. Furthermore, we wanted to establish innovative ways of using laboratory data and quality improvement science methods to embed improvements.

Aim

We wanted to identify simple changes that would improve the request process by reducing the variation hence would reduce the rate of laboratory request rejections from ED.

Method

We inspected laboratory data for sample rejections and identified common themes (figure one).

We studied the process used in ED to create and perform blood requests in order to identify variations. We identified change ideas using established Quality Improvement techniques.

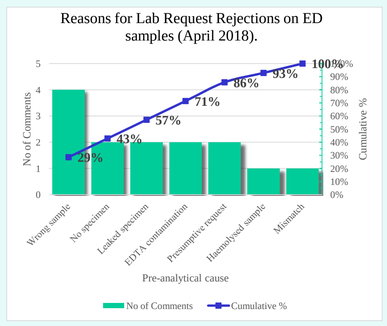


Fig one, Pareto chart of reasons for sample rejections.

Over a three day pre-intervention period and again post-intervention, we audited coagulation and glucose requests.

We used behavioural science methods (COM-B) to understand what interventions might be helpful in addressing rejections due to contamination errors as a result of order of draw variances.

We launched an “order of draw” poster (figure two).

We agreed clinical criteria for coagulation and glucose requesting. In ED, we re-positioned coagulation and glucose tubes away from routine tubes.

Finally, we introduced sessions on accurate labelling for new staff.

Fig two, Order of Draw. This indicates the order to fill different sample tubes in order to prevent contamination.

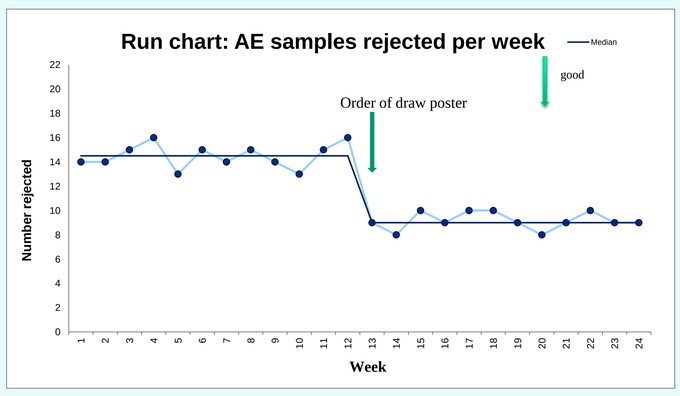
Results

The order of draw intervention reduced rejections from 14 per week to 8 per week, a 43% improvement (Fig three).

Evaluation of the data showed that inappropriate requesting was a significant factor. To address this, we agreed clinical criteria and re-positioned the tubes used to collect coagulation & glucose samples away from the routine tubes.

Of the coagulation requests 61% and of the glucose requests 76% were deemed inappropriate. During follow-up, only 4 patients underwent either of these tests demonstrating a **92%** improvement. We estimate an associated cost saving of around £3,800 annually.

Fig three, run-chart showing weekly rejections prior to and after the “order of draw” intervention. From a mean of c15 rejections per week we show a 43% improvement to 8 per week.



This study was carried out in April-August 2018. In February 2018 **456** coagulations and glucoses had been requested. In February 2019 **88** were requested. This represents an **81%** improvement.

Discussion

This study examined ways of reducing total laboratory request rejections & specific coagulation & glucose analyses from ED in a district general hospital using the Quality Improvement model. The work is strategically aligned with Demand Optimization, Realistic Medicine & the NHS 2020 Vision.

We have demonstrated a **43%** improvement in the rate of rejections together with an **88%** improvement in the number of inappropriate requests.

Additional benefits of this work include effective liaison between Depts and gaining further understanding of the applications & limitations of using laboratory data to address clinical problems.

In addition to QI, alternative models do exist (e.g. Lean, six sigma) but local expertise influenced our choice. Although we have evidence of improvement over a year, further analysis will examine whether or not these improvements continue. Further work will also address transferability of the interventions into other wards & departments.

Conclusion

The aim of this study was to identify simple changes that would improve the process by reducing variation hence would reduce the rate of laboratory request rejections from ED. We used the Quality Improvement model in a team that involved both laboratory and ED staff and we have demonstrated a significant improvement.

Further gains have been seen in interdepartmental working and in developing how we can use laboratory data.

Further work will address the sustainability and transferability of the work.

Acknowledgements

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