At Great Ormond Street Hospital for Children (GOSH), the laboratory receives more than 500,000 samples and performs more than 2.1 million tests a year. An audit in 2017, which was limited to a few departments, revealed that at least 4000 samples were rejected in that year due to pre-analytical errors (PAE) alone.

High rates of rejection lead to a high rate of specimen recollection, mostly blood draws, which in paediatric patients can have significant consequences. It further contributes to delays in results being available, potential delays in diagnosis, treatment and discharge, as well as having a significant impact on patient experience.

Our mission is to always put the child first. For many of the children who come to GOSH, a daunting experience of their stay is when a needle is introduced into a vein. Paediatric blood collection is known to be more challenging because of the patient’s smaller body size, low circulating blood volume, and developing physiology. Collection methods routinely used for adult patients, such as venepuncture, are not always an option for children.

Why change was needed
It is estimated that 70-85% of clinical decisions are based upon the information derived from laboratory test results, so ensuring optimal sample quality and timely delivery is crucial to the patient, the clinician and the efficiency of the

Wisdom Musabaike and Malti Nakrani from Great Ormond Street Hospital for Children outline a project to reduce the number of pre-analytical errors.
Evidence suggests that most errors in the process fall outside the analytical phase.
sequence used at GOSH was different to the order recommended by the suppliers of the bottles, laboratory standards and the World Health Organization. We have now changed our guideline, created new resources, and shared the rationale with staff under the banner “New Year; New Draw”. It wasn’t until we started looking into collection practices and having conversations outside the laboratory that we became aware of the need to standardise the order of blood draw.

Delayed transport was identified as a frequent issue. It is important that blood cultures are sent to the laboratory as soon as possible, so that any bacteria that might be present in the sample can grow, be detected and be treated.

We developed visual guides to remind staff to send these samples via the pneumatic chute system for speed of delivery. Consequently, the increased use of the pneumatic chute has seen a great improvement in the transportation of blood cultures from the ward to the laboratory. There are now very few blood cultures that are received with long delays in transport time. This means that the blood cultures can be incubated quickly, which will reduce the time to detection of pathogens that cause sepsis and allow for quicker patient treatment and management.

The weekly average transport time mean has reduced from 239 minutes (June 2017 to October 2018) to 148 minutes (November 2018 to May 2019)

GOSH has had a new electronic patient record (EPR) system, EPIC, since April 2019. When blood tests are requested on EPIC, the ward staff will be prompted to print a patient label for the tube and will also be reminded of the blood collection sequence in which to take their samples. We are still in the transition phase, but we envisage EPIC will have significant benefit to the PAE project.

**Small changes, big returns**

Our interventions have shown demonstrable quality improvements. As we move forward we will continue to develop and implement changes to reduce sample rejections. We plan to develop a training strategy and practical best practice guide with quick tips for decreasing the likelihood of a sample being rejected, particularly for paediatric patients. We’re going to continue to evaluate the blood collection system in order to standardise the product from one brand. Work is in progress for implementing an alternative coagulation tube for neonates with a reduced minimum volume requirement to facilitate reduction in PAEs.

Establishing a pre-analytical project role has been key in driving this quality improvement. Countless ward visits, engaging with stakeholders, going out there and having conversations with nurses, matrons, HCAs, practice educators, all worked to connect with people who often are not aware of “why” we do things the way we do. Delivering training and education, teaching sessions, and cascading key messages have all been embedded in the work that’s been done so far. Preparing visual aids, posters, screensavers, and newsletters has been the key in disseminating information. We are putting every effort into building pre-analytical relationships and closing the gaps between the laboratories and direct patient care.

We believe that laboratory scientists can make a big impact on patient pathways, and it is crucial we work with the streams of other professionals across trusts to understand pre-analytics – the “unbreakable quality chain” in linking laboratories to clinical areas.

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