Assessing the effect of electronic pathology ordering on repeat tests for paediatric patients

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Repeat tests account for a considerable proportion of pathology testing. Unnecessary repeat tests can increase laboratory workload and costs, along with patient discomfort and safety risks associated with blood draws that can be particularly serious for paediatric patients. The aim of this study was to assess the effect of electronic pathology ordering on repeat tests for paediatric patients.

The study included 85,728 pathology tests ordered for 5,073 children (ages 0 to 18 years) before and after the implementation of electronic ordering. The analysis was stratified by age (<1 year or ≥1 year) and ICU status (ICU and non-ICU). Repeat tests were identified and time intervals between the repeat tests and previous tests of the same type were calculated for all tests. The percentage of repeat tests was defined as the number of repeat tests out of all tests ordered, and calculated for each of the four study groups for both paper and electronic test orders. The cumulative percentage was computed for each whole hour.

This study showed that, for children in ICUs, the repeat test order rate was significantly lower when doctors used the electronic ordering systems than for paper-based orders. Similarly, the rate of repeat tests ordered within short intervals (up to 23-hours), for children older than one-year in non-ICU wards, was lower for electronic ordering than for paper ordering. The proportion of repeat tests occurring within one-hour of the previous test was consistently lower for tests ordered using electronic ordering than it was for tests ordered using the paper based system for patients older than one-year in all wards and for patients under one-year in ICUs.

These results suggest that features of the electronic system, including alerts about previously ordered tests and the availability of information about previous orders, can significantly assist clinicians to identify and reduce unnecessary repeat tests. The study provides the basis for supporting the continued development of decision support within pathology ordering systems to support clinical practice and improve patient outcomes. The study demonstrated a significant change in clinician ordering which had positive outcomes for very young children who were exposed to fewer unnecessary tests. The reduction in unnecessary tests also impacts laboratory costs and workload. Results are being widely disseminated to key stakeholders involved in the design, implementation and eHealth policy development associated with electronic pathology systems. The project was highly collaborative involving researchers, clinicians, scientists and policy makers including the Chief Pathologist for NSW, Professor Roger Wilson, who was a co-author on this publication.