ANALYSIS OF PRE-ANALYTICAL NON-CONFORMANCE IN A MEDIUM SIZED PRIVATE PATHOLOGY LABORATORY

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Aims: To determine the types and frequency of pre-analytical incidences of non-conformance in a medium-sized private pathology laboratory and evaluate corrective actions.
Methods: A retrospective audit was performed at Southern IML Pathology in Wollongong and Nowra, NSW, to identify incidences of non-conformance over a 12 month period from October 2012 to September 2013. Data were obtained using an in-house non-conformance reporting system and from the quarterly RCPA Key Incident Monitoring and Management System. Corrective actions were evaluated from records kept on Apollo PowerTerm Pro laboratory information system.
Results: Preliminary data indicate that there were a total of 10,862 incidences of non-conformance between 1 October 2012 and 30 September 2013. There were 3503 incidences of non-conformance to collection documentation, 2156 incidences in data entry, 91 incidences in labelling of specimens and 2129 incidences in specimen reception area coding. There were 2983 incidences that needed recollection. Analysis of non-conformance incidences and evaluation of corrective actions are currently in progress.
Discussion: This is one of few audits of pre-analytical incidences of non-conformance that have been performed in a medium sized private laboratory setting. This audit will serve as a tool in internal quality assurance to improve our current practices and monitor progress.

STREAMLINING THE INITIAL SAMPLE RECEIPT PROCESS USING LEAN METHODOLOGY

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Prior to assessing the need for front-end automation, a Lean based process improvement project to optimise the central specimen receipt and sorting area at Canterbury Health Laboratories (CHL) was initiated. A dedicated project team was established and used a structured framework to define improvement opportunities, identify root causes, implement improvement initiatives and establish control measures and sustainability plans ensuring initiatives were maintained and developed.
The implementation of direct sorting of all samples on receipt streamlined the process, reduced sorting duplication and sample touch points. In addition there was a 25% increase in the number of samples going directly to the automated analysers from central reception and a greater than 85% reduction in the number of samples sorted to testing laboratories by core chemistry. Overall there was a 56% reduction in the number of samples going through the core chemistry separating area. Sustainability planning involved a task specific follow-up list, audit check sheets and determination of key performance indicators. This targeted short timeframe project successfully used Lean tools to implement process improvement initiatives as the basis for continuous improvement.

DEALING WITH THE SRA BOTTLENECK

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Aims: Increased workload due the acquisition of another laboratory had resulted in a significant bottleneck in our Specimen Reception department, caused unacceptably long turnaround times (TAT). The aim of the intervention was to relieve this bottleneck and improve TAT.
Methods: Baseline data were collected to quantitate sample delivery times, the size of the sample queue awaiting SRA processing and the delay time before SRA processing was performed. Based on the two peak sample delivery times, all available SRA staff were deployed into sample processing during two 1-hour periods ('Power Hours') and the above data were recollected and assessed.
Results: The introduction of the 'Power Hours' reduced the percentage of samples awaiting processing at peak workloads from over 30% of the daily workload to less than 10%. The maximum delay in SRA was halved from about 3 hours to 1.5 hours. The sample queue awaiting SRA processing was dealt with by 9pm compared to 11pm.
Discussion: The introduction of the 'Power Hours' significantly improved the SRA processing TAT. This TAT reduction persisted throughout the rest of the working day and was achieved without employing additional SRA staff resources.

THE CORE BIOPSY: AN UNEXPECTED JOURNEY

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Think of a pathology specimen as your suitcase. When we check into a flight, that suitcase needs to be identified and tagged in a way to allow it to follow you across the world to your final destination. It passes through many checkpoints, conveyor belts and holds, and we trust that this will happen, but sometimes the process fails. A pathology specimen also has a long journey through the test cycle in an anatomical pathology lab, passing from bench to bench, hand to hand through many stages, and a great deal of trust is placed in the process by the patient and clinician, but this process can also fail. Understandably an error in tracking suitcases, although irritating, is often not as life changing as an error in a pathology lab, but in both instances, the start of the chain is often the most pivotal, with appropriate checkpoints also in place along the way.
There has been a significant number of reports in recent times highlighting poor clinical outcomes as a result of pre-analytical errors within pathology labs. This has prompted us to review our practice. We have implemented a number of strategies to limit errors in relation to the processing of core biopsy specimens. We would like to share our experiences and engage other labs to come together to further improve patient safety.

FALSELY ELEVATED PLASMA SELENIUM DUE TO GADOLINIUM CONTRAST INTERFERENCE: A NOVEL SOLUTION TO A PRE-ANALYTICAL PROBLEM

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Aims/Background: Trace elements are commonly measured by inductively coupled mass spectrometry (ICP-MS). A 33-year-old male had a reduced plasma zinc on ICP-MS of 8.5 μmol/L (reference interval 10–17). Plasma selenium (Se) concentration was incidentally found to be 66 μmol/L (reference interval 0.45–1.4), a potentially lethal level, despite not taking selenium

supplements, no occupational exposure and no toxicity symptoms. He had earlier undergone magnetic resonance imaging (MRI) with gadolinium (Gd) contrast which is known to interfere with Se on ICP-MS (as the mass to charge ratio of Gd^{2+} with atomic weight 156 is the same as two Se^{+} with atomic weight 78). We aimed to adjust our method to prevent this pre-analytical interference.

Methods: Selenium is measured on an Agilent 7700 (by monitoring Se-78 isotope), which we modified to also include the Se-82 isotope.

Results: Plasma Se results ($n = 40$) derived from monitoring the two different Se isotopes gave similar results with a good correlation ($R^2 = 0.99$). On repeat analysis, our patient had Se concentration of 65 μmol/L with the Se-78 isotope but only 1.43 μmol/L using Se-82. Gd-156 isotope was also elevated.

Conclusion: To avoid misleading Se results, we suggest that plasma Se analysis by ICP-MS should include a second Se isotope that is not subject to this interference.

A QUALITY IMPROVEMENT COMPARATIVE STUDY FOR RESPIRATORY SPECIMEN PROCESSING, SCREENING AND REPORTING

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The current laboratory procedures for respiratory specimen processing are the pick and smear technique for sputum specimens and a concentrated direct smear from a cell pellet for bronchial brush/wash. Both techniques each produce two slides to examine.

This study aims to compare the screening productivity, cytological findings, diagnostic sensitivity and specificity of respiratory specimens using the current methods for processing with those of a liquid-based SurePath method (LBC-SPM) for the detection of abnormalities, and the possibility of reducing the number of unsatisfactory samples.

Approximately 200 respiratory specimens will be prepared using both current and LBC-SPM and assessed using the following criteria: diagnoses, the presence of obscuring material and time taken to screen the slides.

The expected quality improvement outcomes of this study using the LBC-SPM should reduce the screening time of the specimen due to the reduced number of slides and a smaller screening area. Furthermore, clearer, more visible preparations should decrease obscuring inflammatory and foreign material and thus possibly increase the sensitivity and specificity rate and decrease the unsatisfactory rate.

Should these results show a statistically significant improvement in any of the quality improvement objectives, recommendations will be discussed and implemented according to management assessment and approval.