

# Workflow optimization in a clinical laboratory using lean management principles in the pre-analytical phase

- Letelier P.<sup>a</sup>,
- Guzmán N.<sup>a</sup>,
- Medina G.<sup>a</sup>,
- Calcumil L.<sup>a</sup>,
- Huencho P.<sup>a</sup>,
- Mora J.<sup>a</sup>,
- Quiñones F.<sup>b</sup>,
- Jara J.<sup>b</sup>,
- Reyno C.<sup>c</sup>,
- Farías J.G.<sup>d</sup>,
- Belén L.H.<sup>d</sup>,
- Brebi P.<sup>e</sup>

## Abstract

**Background:** The application of the Lean methodology in clinical laboratories can improve workflow and user satisfaction through the efficient delivery of analytical results. The purpose of this study was to optimise delivery times of the test results at a clinical laboratory, using Lean management principles in the pre-analytical phase. **Methods:** A prospective study with a quasi-experimental design was implemented. Staff functions were restructured and sample flows were modified. Delivery times of clinical results (glucose and haematocrit; 6648 data) from the Medicine and Adult Emergency services for years 2017 and 2018 were compared. **Results:** A reduction ( $p < 0.05$ ) in turnaround times in the delivery of glucose test results at the adult emergency service was observed (84 to 73 min, 13%, pre and post). In addition, there was a non-significant reduction in the turnaround times for glucose (Medicine) and haematocrit in both services. In the analytical and post-analytical phase (not intervened), an increase in turnaround times was observed in some cases. **Conclusions:** Other studies have indicated that the application of the Lean methodology in clinical laboratories improves workflow, increasing effectiveness and efficiency. This study showed an improvement in the delivery time of test results (glucose - Emergency), giving rise to a culture of cooperation and continuous improvement. It would, however, be essential to address the management model integrating the analytical and post-analytical phases. © 2021 Sciendo. All rights reserved.

## Author keywords

Clinical laboratory; Lean methodology; Preanalytical phase