



Pre-analytical automation: enhancing molecular diagnosis of sexually transmitted infections (STIs)



Ballesteró-Téllez M¹, Rajadell Guiu M¹, Santillana Cernuda G¹, Mascort Marti S¹, Soler Arpí M¹, Berrar Colmenero C¹, Sanchez Úbeda R¹, Ribas Oriol M¹, Pérez Jové P¹

¹Clinical Microbiology and Parasitology, CATLAB, Barcelona

Conclusion

- The adaptation of sample collection to new clinical guidelines requires laboratories to become more flexible and adaptable in processing diverse sample types and containers with varying characteristics.
- The introduction of the UniVerse® system that automate the pre-analytical phase of sexually transmitted infection (STI) molecular testing ensures process traceability, enhances patient safety, and optimizes workflow efficiency.
- The implementation of the automated UniVerse® system led to a clear reduction in turnaround time, delivering results 31 hours earlier in 2025 compared with 2024.

Introduction

The increasing demand for STI diagnostics has led to a growing number of samples processed in clinical laboratories. In order to ensure rapid and high-quality results, laboratories must adapt to this situation. Pre-analytical automation may be the key to reducing turnaround times.

The aim

The objective was to evaluate the implementation of an automated pre-analytical system (UniVerse®, Copan) in STI diagnostics.

Methods

Samples were obtained from symptomatic and asymptomatic patients and included endocervical, vaginal, urethral, pharyngeal, and rectal specimens. All samples collected in containers not validated for the instrument were excluded from the study. Based on the Lean philosophy, a study was conducted to improve workflow, define the location of the instrument, and reduce the number of duplicate processes. Results from two periods were compared: January - June 2024 (pre-implementation) and January - June 2025 (post-implementation). The number of test requests and turnaround time of the results were analysed.

Samples	Number tests 2024	Result turnaround times 2024	Number tests 2025	Result turnaround times 2025	Time reduction (%)
Endocervical	6.787	58h	6.685	25h	56,9 %
Vaginal	1.540	59h	1.778	25h	57,6 %
Urethral	1.123	57h	980	28h	50,9 %
Pharyngeal	2.330	56h	2.025	26h	53,6 %
Rectal	1.257	58h	866	28h	51,7 %
TOTAL	13.037	57h	12.334	26h	54,4 %

Table 1: Samples processed and turnaround times for the pre-implementation and post-implementation periods

Results

In the first period, 13,037 samples were processed, and in the second, 12,334. **(Table1)**

However, during that period, urine samples could not be processed automatically.

A reduction in pharyngeal and rectal samples was also seen, due to the introduction of the pharyngeal-rectal swab in 2025.

In the Lean study, the double reception of samples was eliminated, changes were made to the pre-analytical process in order to prevent contamination, and inefficient movement of staff and samples was reduced. **(Image 1)**

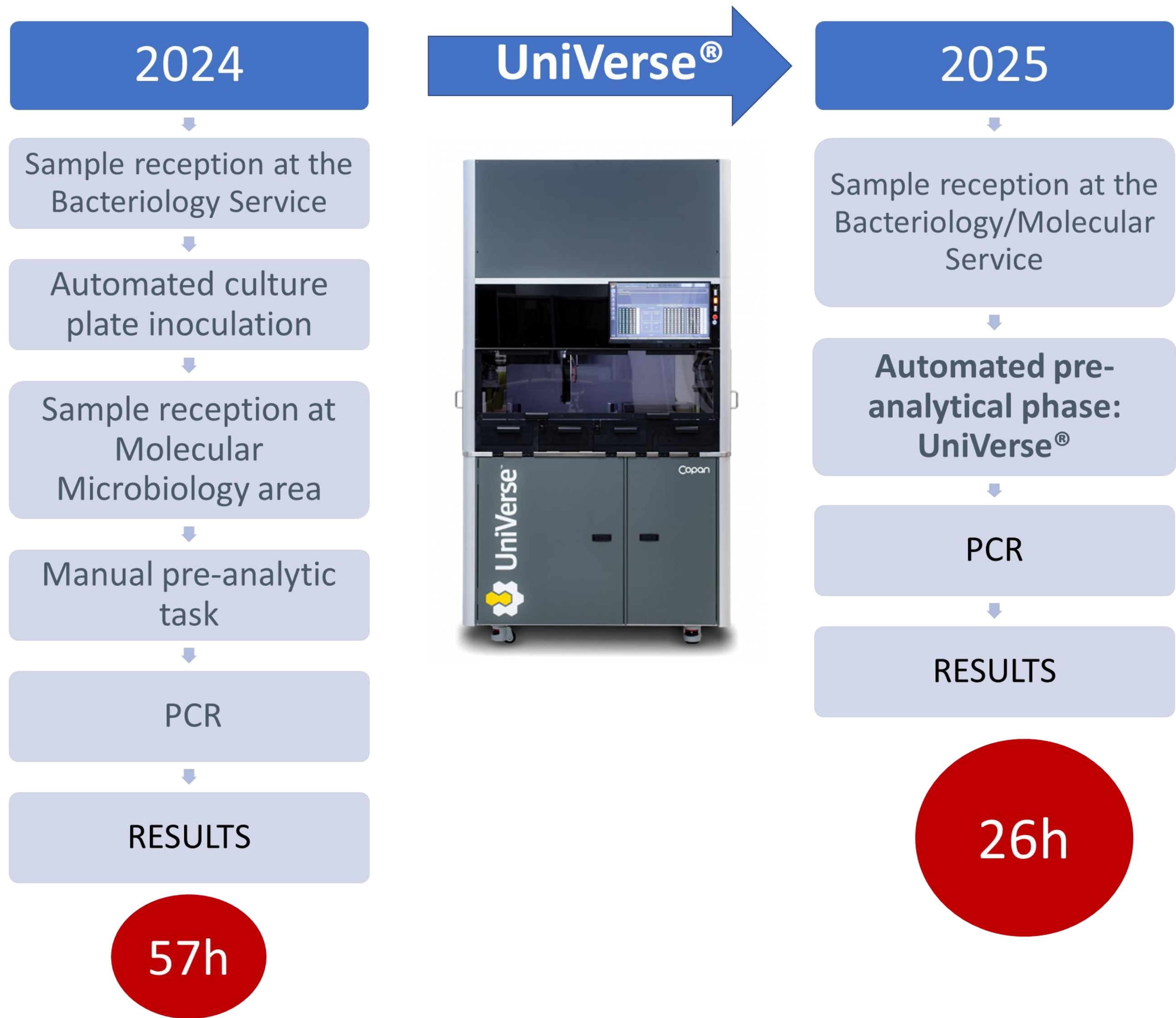


Image 1. Modification of workflows following the Lean study

Consequently, the average distance travelled by staff decreased from 130 meters before to 88 meters after implementation.

The average turnaround time decreased from 57 hours in 2024 to 26 hours in 2025, representing an overall reduction of 54%.

