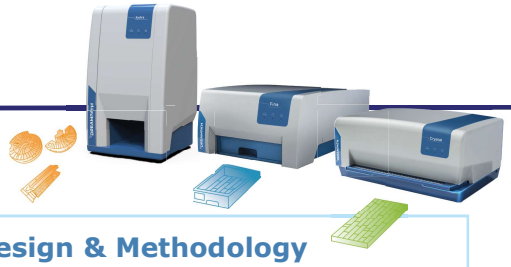
Reducing errors and lost samples through sample tracking in pathology labs.

Gable, S., Cardiff and Vale University Health Board



1. Introduction

Complex workflows in anatomical pathology (AP) laboratories, increasing caseloads, and staff shortages contribute to risks of sample misidentification, misplacement, and inefficient processing.

Cardiff and Vale University Health Board (CVUHB) undertook a programme of workflow improvements through the adoption of advanced sample tracking and archiving technologies.

CVUHB manages around 90,000 specimens annually. From those **90,000 specimens, they produce about 197,000 paraffin tissue blocks and 334,000 glass slides.**

2. Study design & Methodology

The pathology laboratory conducted a multi-year, observational study on the implementation and evaluation of three automated systems targeting key error-prone areas: **block and slide archiving and pre-processing workflows.**

The study introduced barcode-based automation and digital tracking into the AP workflow. Blocks and slides were scanned and archived using dedicated filing systems, eliminating manual sorting. The pre-processing system tracked cassettes and baskets, recorded user activities, and monitored tissue processor schedules in real time. **Key performance indicators included**

- **Sample reconciliation time**
- **Manual touchpoints**
- **Time spent scanning**

3. Results

Implementation of the new system yielded substantial operational improvements across multiple stages of the workflow.

Sample reconciliation time was reduced by 82%, decreasing from an average of three days to approximately 2.5 hours.
The pre-processing workflow was streamlined through the elimination of 96 manual steps, substantially reducing the risk of human error.

Scanning efficiency also improved, with scanning time reduced by 91%.

In aggregate, the optimized processes saved an estimated 3,411 staff hours annually in block and slide sorting and archival tasks.

Beyond quantitative gains, the intervention enhanced traceability and security of sample handling, contributing to improved staff confidence in the reliability of the workflow.

Sample Reconciliation Time

- *Before:* 3 days
- *After:* 2.5 hours

82% reduction

96 Manual Steps Eliminated

91% Scanning time reduction

3411 annual hours saved in block and slide sorting and archival

From right to left, Hydra, Fina and Crystal in use at CVUHB .

4. Conclusion

The integration of automated tracking and archiving systems at CVUHB markedly i**mproved efficiency, reduced errors and sample loss, and enhanced staff satisfaction**. By streamlining complex processes and minimizing reliance on manual workflows, the system strengthened traceability and security in sample handling while fostering greater confidence among staff.

These improvements demonstrate that digital innovations can provide a sustainable and scalable solution for anatomic pathology laboratories, enabling them to manage increasing workloads and resource constraints more effectively. Ultimately, such advances **contribute to safer, more reliable patient care and support the continued modernization of pathology services.**

In collaboration with: DREAMPATH

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