NHS Lothian – Medical Pioneers

With a history dating back to the 16th century, NHS Lothian has a proud record of providing advanced health care services to the 800,000 people in the Scottish city of Edinburgh and surrounding Lothian regions.

Throughout centuries of care, the institutions that now make up NHS Lothian have supported an impressive array of doctors, surgeons and scientists who have influenced and advanced medical practice throughout the world.

Currently the UK’s second largest health service, NHS Lothian now encompasses 21 hospitals (including 4 major teaching hospitals) and 126 GP practices as well as an extensive network of community pharmacies, dental practices, and ophthalmic services. These modern facilities provide a wide range of specialist services for people from across Scotland, including liver and kidney transplantation, neo-natal intensive care, cancer services and complex surgery.

While proud of their past achievements, NHS Lothian continues to focus on the future. They are committed to constant improvement through staff engagement, service planning and ongoing modernization that will allow them to provide better services to more people.

The Royal Infirmary of Edinburgh Histology Department – Constantly improving

Histology services for the entire NHS Lothian network are provided by the very busy histology department at the Royal Infirmary. This facility assists nearly 60,000 patients per year and delivers over 5,000 slides, including routine, special and IHC stains, every week.

To keep up with this large and growing workload, the department uses Lean principles to constantly improve processes and service. According to David Elliot, Clinical Pathology Manager, Department of Pathology: “We look to renew the way we work on a regular basis and have Kaizen events to streamline and improve our patient service”.

“Leica CEREBRO provided us with the ability to follow each sample through every step of the histology process. This is extremely important … we haven’t found this feature in any other system”

David Elliot
One area where the department is focusing on is specimen tracking with the aim to ensure “confidence that the specimen slide presented to the pathologists is from the specimen that was received in the lab.” Elliot explains that histology has multiple stages where numbers are transcribed manually on cassettes, slides and labels and these are areas where errors could occur resulting in drastic consequences.

Lynda Ferrigan, ICC Services Manager for Immuno Slide Chemistry, has similar concerns with the slide relabelling that traditionally occurs in the immuno laboratory. She explains that they are trying to improve efficiency by eliminating duplicate tasks as part of their Lean pathology project and also that relabelling “just gives you another instance where you can make an error”.

**Sample Tracking Systems – helping ensure patient safety and laboratory efficiency.**

Histology laboratories have traditionally used manual paper-based systems and hand-labelling to identify and track patient samples. However the Royal Infirmary histology department, who are constantly striving to improve laboratory efficiency and patient safety, looked to sample tracking systems as part of their quest for continuous improvement.

“We were trying to cut down on human error and a lot of paperwork” explains Anne Wright, Histology Services Manager, who initially looked at sample tracking to cut error rates and also ensure “a perfect audit trail”.

Sample tracking systems, such as the Leica CEREBRO system that the pathology department looked to, can fulfil these requirements by eliminating manual labelling, confirming specimen identification at each stage and by generating reports that demonstrate traceability.

Also, according to Elliot, a system like Leica CEREBRO would help with their Lean implementation by “monitoring the work as it goes through the laboratory”. He explained that such tracking was previously lacking and that Leica CEREBRO would “point us in the right direction”.

---

**NHS Lothian Serving 800,000 people**

**Yearly workload at the Royal Infirmary Histology Department:**

<table>
<thead>
<tr>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Requests</td>
<td>58,950</td>
</tr>
<tr>
<td>Specimens</td>
<td>85,175</td>
</tr>
<tr>
<td>Blocks</td>
<td>161,147</td>
</tr>
<tr>
<td>H&amp;E slides</td>
<td>190,453</td>
</tr>
<tr>
<td>Special slides</td>
<td>14,899</td>
</tr>
<tr>
<td>Immuno slides</td>
<td>70,619</td>
</tr>
<tr>
<td>Blanks</td>
<td>3,692</td>
</tr>
</tbody>
</table>

---

Alistair McCondochie uses Leica CEREBRO to identify blocks and slides.

Michael Herriot scans slides to confirm their identity using Leica CEREBRO.
Implementing Change

Introducing a sample tracking solution to a laboratory is a complex task as it touches all aspects of the laboratory workflow. The Royal Infirmary’s Lean programme, along with assistance from Leica Microsystems’ Lean consultants, meant that the pathology department was able to benefit from powerful tools like Value Stream Mapping (VSM) when planning their sample tracking system. This work helped ensure Leica CEREBRO delivered the gains they were looking for with Ferrigan commenting that she was really looking to eliminate duplicate tasks and that “CEREBRO is definitely on the right track for doing that”.

With any new process, staff members who have been doing tasks for a long time can be resistant to change. Wright commented that initially there was some apprehension in the histology area, especially among some members who were concerned about the computer, but after a “short period of time they thought it was very good”.

Ferrigan agreed that the staff “have been very positive” and also thought that the “very patient” training provided by Leica Microsystems was most beneficial.

One of the keys to rapid staff acceptance is ensuring that the system that works with the operators. This is an area where Grant Halliday, BMS Specialist, praised Leica CEREBRO saying it is “a very user friendly system” that “works hand-in-hand” the BMS.

Leica CEREBRO – reducing risk while improving productivity

“Leica CEREBRO provided us with the ability to follow a sample through every step of the histology process. This is extremely important, looking at workflows, seeing where errors occur or where issues may arise, we haven’t found this feature in any other system.” Elliot comments when explaining why the Royal Infirmary chose to work with the Leica CEREBRO sample tracking system.

Leica CEREBRO helped the Royal Infirmary eliminate transcription errors and patient misidentification by establishing a secure link between patient and tissue. The system connected to the hospital’s Laboratory Information System (LIS) and used the hospital’s unique identifier to ensure that at each stage, the operator had the right specimen and was performing the right procedure.

Throughout the process, from receipt to pathologist, each request form, specimen container, cassette and slide was permanently labelled with high quality 2D barcoded human and machine-readable identifiers.

After using the system, Grant Halliday believed Leica CEREBRO certainly reduced potential errors saying it: “Cut down on what we would call basic errors, which could snowball into potential clinical errors”.

With the Leica CEREBRO system, identification is verified during grossing, embedding and sectioning. Print-on-demand can occur at critical stations including cassettes at grossing and slides at microtomy. This allows for single piece flow and just-in-time preparation. This eliminates waste and creates a workflow that BMS Leanne Duffy described as “just so fluid”.

After using Leica CEREBRO for her daily work, Duffy was definitely impressed by the benefits of the new system commenting that: “you get into a rhythm … you don’t need to worry about bits of paper, you reduce mistakes … just perfect”.

Lynda Ferrigan, ICC Services Manager.

Graeme Barry scans a sample into Leica CEREBRO.
Part of a Total Solution

Leica CEREBRO has the flexibility to work with most existing laboratory equipment or it can integrate it into a Total Histology Solution with Leica Microsystems assisting with workflow and application support for the entire histology workflow.

At the Royal Infirmary general histology laboratory, the system worked seamlessly with their existing equipment.

In the immuno area however they enjoyed the added benefits of integrating Leica CEREBRO with their five Leica BOND IHC/ISH stainers. Ferrigan explained that prior to Leica CEREBRO integration they needed to re-label slides, but this has now been eliminated which “definitely sped things up”. The integration also eliminated many existing opportunities for error by eliminating transcription and re-labelling. Ferrigan also explained that the system cut down on slides being stained with the wrong antibody as “BOND picks up [the antibody information] and stains accordingly”.

An ongoing commitment to better patient care

For the Royal Infirmary, Leica CEREBRO is part of their ongoing drive to deliver better patient care.

By eliminating the errors that come with hand-written identifiers and by positively identifying specimens throughout the histology process, Leica CEREBRO has certainly helped the Royal Infirmary ensure that the right patient is getting the correct diagnosis.

According to Wright, there is agreement in the pathology department that Leica CEREBRO is definitely the future of histology. “We just found it enlightening the way that pathology is going to go in the future, I’m sure Lynda and most staff will agree with us. It has cut down on the number of errors.”

The Royal Infirmary of Edinburgh Histology Department (left to right) at Anna Winning, Michael Herriot, Margaret Ross, Scott Maxwell, Anne Beattie, Graeme Barry, Gordon Kirk, Tim Ingman and John Lauder.