

Improving Workflow Processes in Staining and Coverslipping

Cheltenham General Hospital

Cheltenham General Hospital's pathology laboratory provides vital processing of specimens in order to aid diagnosis and treatment of cancers and other serious diseases. Their success requires reliable staining and coverslipping results.

Their choice of instruments? Thermo Scientific™ Gemini™ AS Autostainer and Thermo Scientific™ ClearVue™ Coverslipper.

Profile

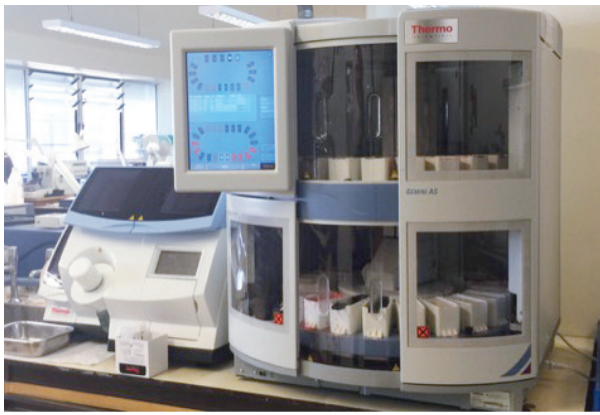
Since 2004, Cheltenham General Hospital has been part of one of the largest NHS Foundation Trusts in the UK. Serving a geographic area from the Forest of Dean to Cirencester, and Stroud to Redditch, the hospital's pathology laboratory provides vital processing of tissue and fluid specimens in order to aid diagnosis and treatment of cancers and other serious diseases. Their mission is to improve health by putting patients at the centre of excellent specialist care. Central to that is their requirement for reliable staining and coverslipping.

As laboratories are put under mounting pressure to increase productivity and reduce turnaround times, laboratory managers are faced with the constant challenge to meet targets and reduce costs. This is often



with limitations on budgets and headcount imposed by the trusts in the current economic climate. Mark Annis is the Deputy Pathology Laboratory Manager at Cheltenham General Hospital, who faces such challenges on a daily basis. Mark supervises the busy laboratory, where in 2014 they dealt with over 42,000 new cases, an average of over 800 per week.

Despite having a team of only eight to ten full-time-equivalent, registered BMS staff and four MLA's, in 2015 that case load meant almost 143,000 Hematoxylin & Eosin (H&E) stains being carried out in the laboratory. A service area covering over 100 GP surgeries as well as referral cases from two private hospitals means that the need for optimised workflow has never been greater.



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When the laboratory workload was reaching the extent that additional capacity was required, Cheltenham began to look at options for their staining and coverslipping. A tender was submitted and three different companies were brought in for trial of their instruments. After performing favourably and being on the NHS-preferred-supplier framework, the Thermo Scientific Gemini AS autostainer was selected, along with the ClearVue coverslipper. The Gemini features five heaters, 26 reagent pots and intelligent software to automatically optimise reagent layout and maximise throughput even with multiple racks and protocols. The ClearVue coverslipper is capable of managing up to eleven slide racks simultaneously, and can handle both histology and cytology slides without user intervention.

Staining and coverslipping – is a combined unit really the answer to optimising workflow?

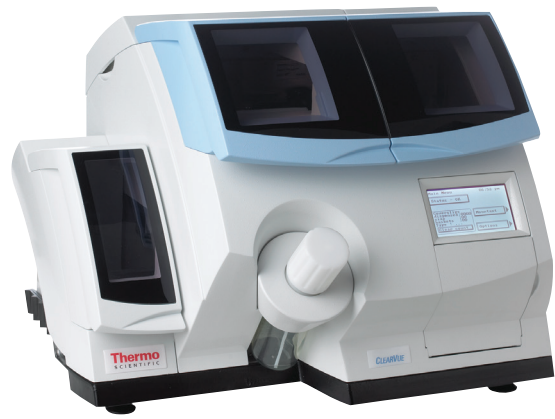
Initially, Cheltenham wasn't actively considering the Gemini unit. At the top of its "ideal" list was a combined stainer and coverslipper system. However, a trial of such a system gave disappointing results. Mark explains, "We were trying to cut out one of the intervention steps – when the stainer finishes you have to put the rack onto the coverslipper to do the next stage. But that's a minor issue now with the time that the Gemini has saved us. As one rack finishes, you just do the next step and drop it onto the ClearVue."

After installing the Gemini AS autostainer and ClearVue coverslipper, the staff at Cheltenham soon found that their laboratory workflow was optimised far better than they thought possible. There is now far less queuing, waiting, and delay. The bottleneck is now right at the end of the workflow where staff sort and label the slides. As Mark explains, "Other manufacturers state that the staining process takes a certain amount of time, but because of the limited number of ovens or reagent stations, the more racks you put on the slower it gets. With the Gemini you can have twelve racks on the go and you know every single rack is going to take the same amount of time."

“After the first few weeks, however, it became obvious that we could just put everything on the Gemini, and I don't think that the other instrument is now being used at all.”

Mark Annis, Deputy Pathology Laboratory Manager





Mark continues, “The intention was to have both of our stainers running together to cover the workload coming through. After the first few weeks, however, it became obvious that we could just put everything on the Gemini, and I don’t think that the other instrument is now being used at all.” The staff also like the Gemini’s simple interface, where they can see at a glance which stains are loaded into which pots, and during processing they can see where a particular rack is up to. If a certain slide is required for a meeting, they can see exactly what time it will be finished.

While laboratory throughput typically remains at a consistent level, issues such as staffing shortages can often lead to backlogs building up. In January, 2015, the Gemini and ClearVue certainly proved their worth to the laboratory in Cheltenham. As Mark explains, “We had nine people cutting all day, every day for two weeks to clear the backlog, and it all went through the Gemini. We had the other stainer set up ready to go but as people were cutting and the slides coming through, the Gemini just coped with it! We were running out of racks because it was going through so fast!” During this backlog the Gemini and ClearVue were processing over 2,000 slides per day with no problem at all. Mark goes on to comment “Having the Gemini and ClearVue now, I wouldn’t specify a combined unit.”

The importance of cleaning and maintenance

The staff at Cheltenham understands that vital to the smooth running of the laboratory are regular maintenance and servicing – especially of the coverslipper.

The combination of glass, glue and moving parts means that correct cleaning is paramount to ensure minimal downtime. They make sure that everyone is trained to the same high level, including a twelve-week program to cover all areas and competencies. All staff follow the documented maintenance list religiously, and the results speak for themselves. Mark comments, “While the old coverslippers are intended for use with the immunohistochemistry and special stains, the staff find them very temperamental, and tend to come and use the ClearVue anyway – and there is still space for that.”

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Mark Anniss,
Deputy Pathology
Laboratory Manager



Cost savings

Due to the high throughput in the laboratory, the staff at Cheltenham typically change the staining reagents on a daily basis. Mark explains, “We used to top up the reagents daily and change the Haematoxylin and Eosin stains weekly. Now rather than to watch to see when results are deteriorating, we found that it makes sense to change them all daily. As the previous stainer required 450ml in each station, this equates to over 25% reagent savings by using the smaller 320ml pots in the Gemini instrument. The staff also reported the reagent change to be far easier.

Rapid throughput of urgent cases

In line with all NHS trusts, the Cheltenham General Hospital is under close scrutiny and pressure to meet targets for sample turnaround and optimised patient care. Combining basic triage, to ensure every diagnostic test is pushed through, and use of the Gemini autostainer to facilitate “urgent” sample staining, they now meet the required throughput time for 100% of biopsies.

Again, Mark explains “All we can do is make sure that there is no delay on our part. A diagnostic call or something where they are urgently waiting on results to commence patient treatment can get rushed through quickly. The Gemini has helped us do that. We drop in urgent racks several times a day where results are needed quickly. Before, there would be another day’s delay queuing for the staining machine. Families and lives are on the end of it, and we certainly couldn’t have achieved that before having the Gemini.”

Future plans at Cheltenham?

With future plans including bringing vital HER2 testing in house, Cheltenham’s workload is only going to increase. After the success of Gemini, Mark concluded “If our workload did increase we’d need more instrumentation I’m sure, and would have no problem in just going for another Gemini. We’d really struggle without it now, and just wouldn’t be able to cope. If we’d have known we would have bought one twelve months earlier!”

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