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Testing innovation: How are pathology labs using automation to drive efficiency and innovation in the post-Covid 19 world?

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Senior leaders from the life sciences industry gathered for a virtual roundtable exploring some of the pain points and opportunities for pathology labs as they prepare to refocus on life-saving research, testing, and development in a post-pandemic world.

The Covid-19 pandemic has put a spotlight on the life sciences sector like never before. But while lab turnaround times, accuracy, and testing capacity for Coronavirus samples have become front page news, for pathology labs, the focus has shifted away from the life-saving testing, research and diagnostics they were designed for - and leaders in this field are desperate to get back to business as usual.

Even before the pandemic, pathology labs, supporting both NHS and private healthcare providers, were encountering multiple challenges in accessing the funding, technology, and skills needed to carry out their vital research and development. With Covid-19 shining a light on how critical these services are, the hope is that new funding and innovation will now flow into pathology services, with the recognition that fast, accurate diagnostics is pivotal for securing the best outcomes for patients.

However, while other industries have made clear strides in automating workflows with innovative robotic solutions, the life sciences sector is at risk of falling behind, with testing, accuracy and productivity weighed down by repetitive manual processes, despite the advances made in diagnostics techniques and wider medical research.

At a digital roundtable hosted by National Technology News and Automata, senior industry peers explored the key challenges and possible solutions for laboratory teams working in pathology as they consider the potential of new technologies to drive efficiencies and improve performance while meeting the need for innovation in the post-Covid 19 era.

The event began with a discussion about what impact Covid-related limitations have had on pathology labs.

"We've got quite a lot of new automated tracked equipment, so it was just trying to get the best out of that," said a pathology central specimen reception manager at a UK university hospital. "We had lots of issues trying to automate some of those processes, for example automating requesting of samples away from the old style of very manual system to make that automated."

A consultant clinical biochemist working at a specialist children's hospital said that its lab differs to local regional hub counterparts because of the number of samples and the fact that sample sizes are much smaller.

"Historically in our department we don't have anywhere near as much automation or robotics as what you'll find in many other larger labs, because of that, many of our processes are very hands-on, very manual," he said. "One of the biggest areas of innovation for us is digitisation of processes; pre-Covid I was trying to get NPEx in, which is a lab-to-lab digital link that allows different LIMS systems to talk

to each other, I struggled to get the funding and get that in.

"However, as soon as Covid came in and we had to start referring lots of samples to a regional micro-lab for PCR analysis, that helped me get the funding to bring in and to digitise that process."

The lab manager from a South London hospital said that the organisation's biggest challenge was that staff had to learn quickly to run tests which were not part of their previous repertoire.

"While we did all of that, the turnaround times fragmented other work, and research was out of the window," he explained. "We never had the staff at any one time to run the full service as we used to."

One CPS product manager from the diagnostic solution arm of a Swiss multinational healthcare company said that she had been working with a lot of NHS sites throughout the pandemic.

"I think actually the impact of Covid probably started well before the pandemic," she remarked. "The squeezes on the NHS, and particularly on pathology, to save money across the board certainly won't have helped where cost savings are being requested left, right and centre on departments that are already squeezed for resources anyway."

A consultant specialising in infectious diseases, microbiology, and virology at another London-based hospital said that the pathology lab is part of a hub-and-spoke model which services eight hospitals and around two hundred GP practices.

"I think there is a negative potential around automation of microbiology, that is the lesson we've learned from Covid-19 around rapidity of microbiology reporting and where micro was historically seen as a 24/48/72 hour resulting specialty which is primarily suited to centralisation and automation," he said. "What we've seen is that certainly in secondary care settings, speed for microbiology reaps dividends, which means no more Carter report hub-and-spoke centralisation, which means decentralisation again in that cycle of the wheel, which means miniaturisation, which means near-patient testing for microbiology."

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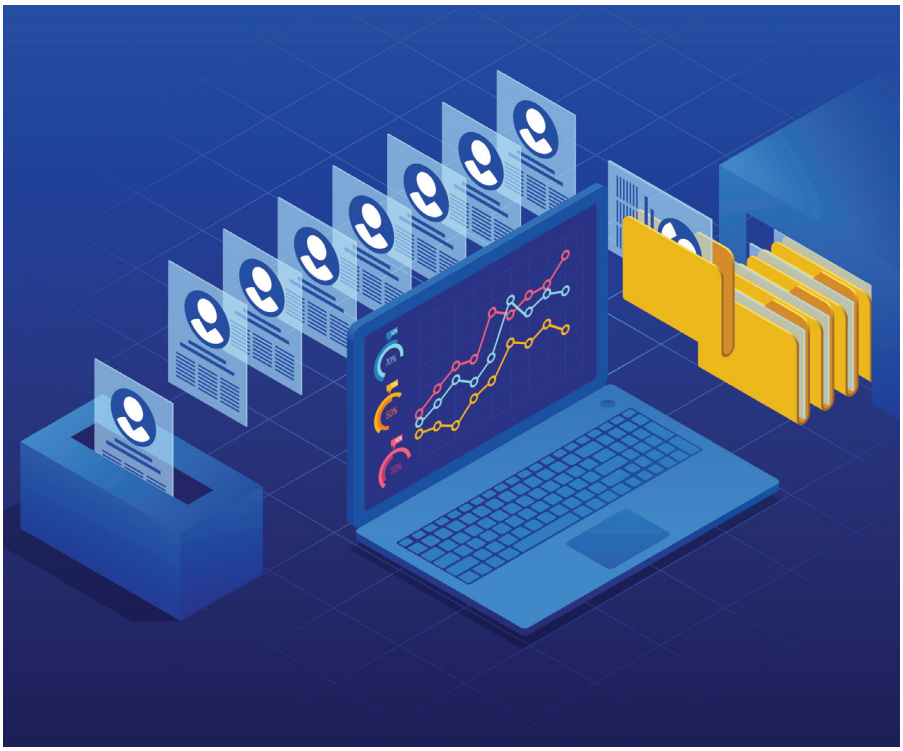

Another product manager from the Swiss healthcare company explained that during the pandemic, there has been a lot of focus on the prioritisation of services and lab workers doing more with less.

"What I also feel is digitisation and digital products are now no longer seen as something that comes along with the box that you've bought," he added. "We've also seen COVID bring about how important access to diagnostics is, so not necessarily point-of-care testing - which is incredibly important - but how members of the public can receive results without even leaving the house and the importance of that kind of mail-in service."

One chief biomedical scientist at an NHS hospital told the group that regarding the impact of the pandemic, as being a separate virology service, it had a supportive role in providing backfill to help virology bring in their new systems.

"When it comes to the actual processing of specimens - as with all of the shortage of swab types, specimen containers, blood tubes and everything, most analysers - whether they be microbiology or whether they be blood sciences - are set up to receive one type of specimen container," they added. "Suddenly, at short notice, having to be able to accommodate a different manufacturer or certainly for using automated swab culture as we do here, manual swabs suddenly coming into your process rather than liquid swabs that go onto your analyser for automatic processing, that does provide real problems, as does just the general lack of swabs."

A labratory manager from a company specialising in diagnostics said that the

pandemic has had a dramatic impact.

"We've just had our one-year anniversary, processing nearly four-million samples," he commented. "A lot of the challenges initially were setting up sample receipts, the lab quality systems, health and safety systems, facilities, all within record timing."

Nick Pattinson, senior product manager at Automata, noted a theme among attendees relating to the pace that can be achieved when funding is unlocked.

"Another thing that jumped out was the people side of this problem - one thing that we were talking to one NHS Trust about on Monday was that they were saying Covid for various reasons has triggered a load of people to start leaving their jobs without other jobs to go to, just based on the pressure that they've been under and the situation," remarked Pattinson.

Next the senior leader talked about current pain points for supporting the NHS and other organisations in meeting post-Covid demand for pathology services.

"With a lot of the changes, it's actually probably about making better use of space, because the most labs are almost working shoulder to shoulder," said the pathology central specimen reception manager from a hospital in the north of England. "I think communication between different hospitals has improved, because there's been probably more teamworking than there has been for many years."

One clinical director for pathology at a children's hospital said that he had been experiencing similar issues.

"One of our big stresses at the moment is rapid Covid testing to support patient throughput through our acute areas, it's non-elective screening, rapid screening of non-elective admissions, to ED, to EDU, on to surgery," he said. "Like other sites, at the start of Covid-19, loads of extra molecular equipment was thrown at us and overnight we ended up with 16 SAMBA units, which is fantastic, although like others we've now been left with a hefty maintenance bill to keep them."

The CPS product manager from a European diagnostics company asked the group if the constant changes in political legislation around Covid testing was a pain point or whether having the government take over certain parts had made things easier.

"In my experience, I think it's not been that helpful," one senior leader responded. "When people outside of work ask how it's been and I say to them we've been in this pandemic for a year and a half, you'd think that everything would be static and established, but actually it feels like every other week there's a new government policy that comes out that wants us to change how we test, how we report, change our patient pathways."

A chief biomedical scientist from an NHS hospital in the South East said that one thing he regularly hears is people moaning about "doing Boris' figures."

"It's all a bit double, triple, quadruple reporting, which is never good in any kind of process," he added. "Another issue I would say that we definitely have is staffing and the capacity that the laboratory has to absorb change; we've lost lots of staff to run these Covid labs."

One consultant specialising in infectious diseases, microbiology, and virology at an NHS hospital echoed the point about staffing: "It is crunch point in every single lab colleague who I talk to, particularly on the scientific side but also on the medical pathologist side as well."

The lab manager from an NHS hospital in London said that the organisation was feeling first-hand the issue of decentralisation.

"Sometimes it's not a good place to be," he warned. "A problem we've got with that is that I've got to multi-skill microbiology staff to do my pathology work, that brings a lot of pressure to staff, hopefully automation can play a key role so that staff can use multiple equipment in the simplest way possible to generate a better result."

The CPS product manager from a European diagnostics company asked the group another question about whether after Covid the industry will see a shift

away from a focus on price and onto the importance of quality.

"One of my colleagues on the call earlier mentioned that old adage of only one quid in a hundred is spent on diagnostics, but no one is going to offer us £2 unless we can prove that for that 100 per cent increase there is added value," replied a consultant from a hospital in the capital.

The clinical director for pathology at a children's hospital said that it had deployed a national pathology dashboard.

"I can see its value - it gives assurance to managers above or the leads in the CCGs that our lab is performing at a similar or acceptable level compared to others," he commented. "But I agree – some of it seems like collating numbers for the sake of it. It's an easy measurable target, but what impact does it have?"

One lab manager said that linking pathology performance to outcomes is difficult.

"Part of that is because all pathology departments nowadays, they are either outsourced to private companies or they are partnerships with different governance structures," he explained. "We're put in a challenging situation compared to before, when pathology labs were integral to the hospital itself, so you worked as a department within the hospital, now we work more like suppliers to what the Trust is asking us to do."

One senior leader asked if private outsourcing is a trend that is happening more and more.

"I've got to multi-skill microbiology staff to do my pathology work, that brings a lot of pressure to staff, hopefully automation can play a key role"

"They've completely streamlined down the services within the local hospital laboratory for a more halved sort of structure," said the lab manager working at a large NHS hospital in London. "Clearly covid has shown that probably that's not the best way, because sometimes things have got to be turned round very, very quickly."

The next topic on the agenda was the role that automation can play in making workflows more efficient and whether organisations are experiencing any issues with scaling up testing in the current environment.

"I think if you take the patients out of it and look at the staff working in the laboratories – as you go to these larger and larger laboratories – they are more factory-style settings, so there is the mundanity of reading many hundreds of urine cultures with dubious significance probably attached to the majority of them," commented one senior leader. "Automation has got a place there, which can help eliminate some of that."

A lab manager from a London-based hospital said that he was struggling with the recruitment of staff.

"The few staff I've got, I'm trying to utilise them as best way I can," he explained. "That's where automation comes into play."

A consultant specialising in infectious diseases, microbiology, and virology from an NHS hospital based in London said: "Repetitive mechanical activity, decapping, aliquoting – that is brainless and it needs to happen, it needs to go fully automated. I feel sad for the MLAs who that will impact, but that needs to just happen."

The discussion ended with some final words from Nick Pattinson, Automata's senior product manager: "I think the big thing that is really promising and hopeful in my mind is the idea of more peer-to-peer sharing within the NHS, in particular within those separate things, and hopefully a breaking down of walls. I think that's something that we should continue to work on."