SmartNotes

Automated culture plate reading and the hospital finance crisis: Why wait to unlock the true value of your clinical laboratory?

While clinical laboratories can generate revenue and contribute to cost savings across clinical departments, their potential often goes untapped.

But with hospitals facing a multitude of pressures, including post-COVID financial constraints, rising demand for microbiological testing, and a significant shortage of skilled labor, the health economics arguments for investment are gaining traction.

Automated culture plate reading, for example, can streamline processes to not only boost productivity, but also leave room for expansion into other, often profitable, areas of testing.

Read on to find out how the flexible, low-footprint technology that powers the Clever Culture Systems APAS® Independence instrument could help your hospital shore up its finances today and be ready for the needs of tomorrow.

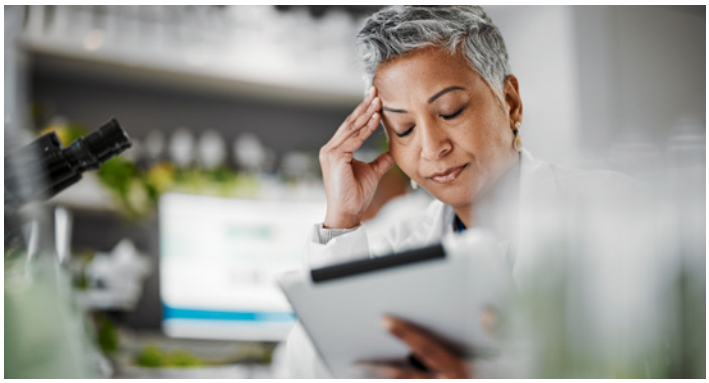
The financial picture

In October 2022, a survey of 900 hospitals, conducted by Kauffman Hall on behalf of the American Hospital Association (AHA), painted a grim picture of hospital finances.[1]

It found that 2022 was the worst year for healthcare provider finances since the outbreak of COVID-19, with hospitals reporting an up to 133% decline in operating margins, when compared to the pre-pandemic period. Between 53% and 68% were operating in the red.[1]

At the same time, costs are continuing to rise. According to the AHA, the price of labor increased by $85bn between 2021 in 2022, and non-labor expenses by $49bn.[1]

"Managing the aftermath of the pandemic has placed the vast majority of America's hospitals in serious financial jeopardy as they experience severe workforce shortages, broken supply chains, the Medicare 2% sequester kicking back in and rapid inflation that has increased the cost of caring," Rick Pollack, AHA president[2]



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This pressure is only expected to worsen, due to rising inflation and the increased demand for services associated with aging populations and the growing number of long-term conditions (LTC) and co-morbidities. Yet no additional federal or state-level support is forthcoming.[1]

There is, then, a clear need for a renewed focus on health economic analyses. Hospitals must optimize existing revenue streams and open up new ones.

Clinical laboratories and their revenue-generating potential

By guiding management strategies, microbiology laboratories can have a substantial impact on the downstream costs of patient care. Their results, for example, may influence length of stay (LOS) and ensure costly resources, such as interventions and medications, are utilized appropriately.[3]

Yet these very same laboratories are facing a slew of specific, interconnected challenges. With the rise in rapid testing technologies, there is an increased expectation of on-demand testing and pressure to provide quicker turnaround time, in order to help reduce the adverse patient outcomes and the additional costs associated with longer LOS. In addition, the sector is experiencing a significant shortage of skilled labor – the United States is 20,000 to 25,000 short on clinical laboratory technicians, and vacancy rates currently stand at between 7 – 11%.[4]

Such difficulties are only expected to intensify in the coming years, but the potential is as intriguing as the challenges are concerning. With the rising incidence of LTCs and co-morbidities and continuing threat of antimicrobial resistance (AMR) driving up demand for testing, laboratories could provide hospitals with additional revenue streams by adopting tests and technologies that are reimbursed at higher rates than traditional tests.

The biggest blocker, however, is productivity. People cannot and will not keep doing more to do more with less, meaning hospitals need to rethink the process if they are to remove the bottleneck and seize the opportunity.

Evolving automation

Automation has long been suggested as a possible solution. It can boost productivity by delegating repetitive tasks to machines, thereby freeing up skilled technicians to work on more value-added tasks. Yet while the world around us has been busy adopting such technologies, uptake has been slow in microbiology.

There are several reasons for this. To date, systems have been expensive to acquire and to maintain. They have required a significant amount of laboratory space and have not easily integrated with existing systems and workflows, presenting logistical and practical barriers to adoption. Many hospitals feel they would be best served by waiting for all elements of total laboratory automation (TLA) to be validated, approved, and commercially available before making the investment.

The APAS Instrument, part of a new generation of solutions designed by microbiologists for microbiologists, is changing the conversation. The automated agar plate reading system has a low acquisition threshold, in terms of price, space, and implementation time. It is the length of a single bench, meaning teams simply roll it into place without the need for costly infrastructure changes.

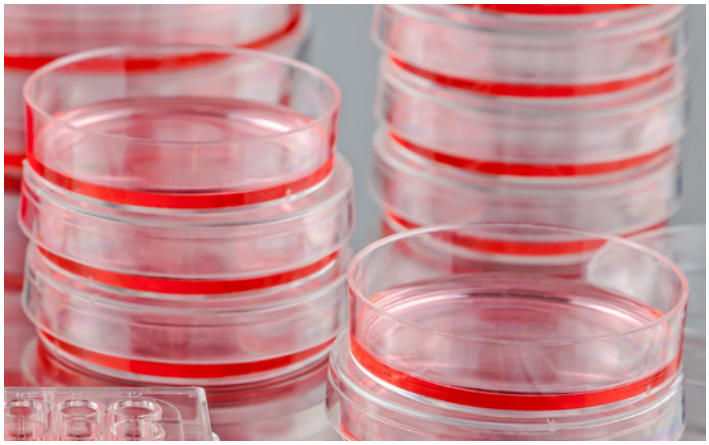
> “Because the APAS Instrument does not include the robotics to inoculate the specimen or an integrated incubator, the cost… was substantially lower than other automation systems. With length and depth dimensions similar to a standard laboratory work table, it was easy to install in the limited space within our laboratory,” Mary George, Ph.D., director of microbiology at Albany Medical Center, Albany, New York.

Crucially, the machine learning-driven APAS Instrument can work independently, or alongside TLA. As such, it can deliver efficiencies and contribute to revenue generation today, while always keeping one eye on the future.

How does the APAS Instrument work?

The APAS Instrument uses image recognition technology to read culture plates and sort them into no growth, significant growth, and those that require further investigation.

It performs this task in just 18 seconds, at a rate of 200 plates per hour, and auto-releases negative plates from the workflow. With large numbers of urine and MRSA cultures being negative, this unique feature means microbiologists can spend their precious time focusing on complex, significant growth plates that require their expertise for accelerated patient care.



CASE STUDY

Urine cultures

Urinary tract infections (UTIs) are among the most common infections in the United States.[5] In 2015, there were an estimated 62,700 UTIs in acute care hospitals, accounting for more than 9.5% of the healthcare-associated infections (HAIs) reported by those centers.[6]

Laboratories already spend a huge amount of time screening urine cultures, the majority of which, almost 70%, are negative.[7] Now, incidence is on the rise, particularly in high income countries with aging populations and an increase in long-term conditions that can contribute to hospitalization and UTI development.[8]

It means that microbiology laboratories will be required to carry out an increasing number of urine cultures. This can either add to the rising pressures, or, if teams have the necessary tools, result in additional income for hospitals.

The Albany Medical Center, in Albany, New York, currently carries out more than 25,000 urine cultures a year, and is expecting that figure to rise by at least 10,000 in the coming months. As part of the laboratory's plan to rise to the challenge, the team adopted the APAS Instrument. During the team's evaluation of the system, they were able to cut the average processing time of a negative test on a blood agar plate from up to 26 seconds with traditional, manual reading, to just 17 seconds with the APAS Instrument.

"The average negative test report turnaround time was decreased by two hours during the first phase of auto-verification implementation," said Mary George, Ph.D., director of microbiology at Albany Medical Center.

By eliminating the hands-on time spent on negative cultures, the APAS instrument helps to deliver faster culture results and allows trained laboratory staff to use their expertise on more complex microbiology testing.

CASE STUDY

MRSA

Methicillin-resistant Staphylococcus aureus (MRSA) is one of the leading causes of HAI, and is commonly associated with significant morbidity, mortality, length of stay, and cost burden.[9] While the overall rate of MRSA cases stabilized between 2017 and 2020, HAI MRSA increased by 13% in 2020.[10]

It means that laboratory technicians are currently spend huge amounts of time screening MRSA plates. But the majority, more than 90%, are negative.[11]

MVZ Labor Ravensburg, one of Germany's largest networks of laboratories, purchased the system in 2022 following a six-month evaluation.

During this time, they recorded a sensitivity of up to 100% and a specificity of 98.8%, allowing them to auto-release negative samples – and save between three and four hours of laboratory technician time every day.

"In terms of laboratory benefits, more than 90% of plates do not need to be manually read, resulting in a substantial reduction of labor time," said Dr. Ulrike Schumacher, medical director of the microbiology department at MVZ Labor Ravensburg, Ravensburg, Germany, adding that maintenance time was only five minutes a day. "This is a really good machine. Try it because it will help."

Crucially, the FDA-cleared CE-marked* APAS Instrument has been shown to have high sensitivity and specificity through more than 20 studies and posters, giving laboratories confidence in its results.

In short, the APAS Instrument is a productivity boosting tool that can jumpstart efficiency savings and generate additional income today, while being flexible enough to also meet the needs of the future.

There's no time to waste. Automated plate reading can help hospitals unlock the true value of their laboratories and treat their growing financial headache.

Learn more about the APAS instrument, and how it can provide significant, immediate value to your laboratory at **thermofisher.com/apas**

*For urine and MRSA analysis modules. For more information, see product manual and Special Use Conditions (urine and MRSA).

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