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A game-changer for faster blood culture

How does a microbiology lab at a large tertiary hospital minimise the time for clinicians to receive blood culture results so they can implement timely, appropriate antibiotic treatment? For Dr Yu-Jiun Chan, director of the Taipei Veterans General Hospital Clinical Microbiology Laboratory in Taiwan, the key to the solution came through **bioMérieux's** fully automated blood culture system – and a little outside-the-lab thinking.

“I’ve personally seen that if a patient gets early, appropriate antibiotic treatment their life can be saved,” says Taipei Veterans General Hospital Microbiology Lab director Dr Yu-Jiun Chan. His background as an internal medicine and infectious diseases doctor gives him insights into clinician needs – and drives his desire to always deliver results faster.

To better serve the roughly 3,000-bed hospital, Chan sought to overcome distance and staffing constraints, especially at night, when there are no lab services or sample transport. Integrating bioMérieux’s BACT/ALERT VIRTUO automated blood culture system helped bring time-savings through features including a barcode-tracking system, automated sign-in, loading and unloading, and high performance in terms of time to detection. “Currently, BACT/ALERT VIRTUO is the only system that fulfills our requirements for automated blood culture,” says Chan.

Automation goes outside the lab

In 2016, the hospital placed a BACT/ALERT VIRTUO unit directly in the emergency department to optimise resources and workflow. Loading requires no special skills, so overnight ER staff load samples themselves to start cultures earlier. Negative samples are automatically discarded, and lab technologists are alerted to unload positives. IT connectivity lets the lab monitor samples remotely.

Previously, time to detection was about four hours longer for samples collected between 8pm and 8am compared with daytime samples, due to delayed entry. “ER doctors appreciate quicker blood culture results,” says Chan. “With



BACT/ALERT VIRTUO can be placed outside the lab and loaded by any staff member.

this automated system, they can now receive results as early as the next day.” The lab is now looking to add another BACT/ALERT VIRTUO in its reception area for easier access to samples from any ward, especially during the night shift.

Integration with ID and AST for actionable information

Chan says that being able to integrate the blood culture system with identification (ID) and antibiotic susceptibility (AST) testing is another important aspect. Blood culture, ID and AST systems by bioMérieux are specifically designed to work together, and Chan’s lab uses a bespoke IT solution to ensure connectivity among the instruments.

Mass spectrometry (VITEK MS) facilitates rapid identification and reporting. “We can get identification to a species level within 24 hours,” says Chan.

“That’s important for bacteraemic patients because studies show that if you can choose an appropriate antibiotic within 24 hours, the outcome will be very different.”

Rapid reports facilitate antimicrobial stewardship and infection control measures

Positive blood culture and Gram stain result alerts are sent to clinicians’ cell phones via the hospital information system, followed by species-level ID. Chan explains that this enables earlier antimicrobial stewardship since clinicians can optimise antibiotics based on these preliminary ID reports. Complete ID and AST results are subsequently transmitted.

“Clinicians may adjust the antibiotic again as soon as the AST report is ready,” he says, noting that their previous workflow offered full ID and AST reports only after three or four days.

The prescribing clinician is not the only person to receive important lab result alerts. “For multidrug-resistant organisms, we send alerts to the infection control team. The in-charge ward nurse is also alerted in case the patient needs isolation or contact precautions.”

Chan says BACT/ALERT VIRTUO makes it easier to offer a better service in the same way that ATMs make it easier for banks. “If you need to do some banking in the night, you don’t need to wait until the bank opens, you can just withdraw at the ATM. That’s the convenience and that’s my concept for BACT/ALERT VIRTUO.” ●

For further information

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