

BLOOD CULTURE AUTOMATION AND CENTRALIZATION IMPACTS THE MANAGEMENT OF GRAM-NEGATIVE BACTEREMIA



Christopher J. Destache

Pharm.D., FCCP
Professor of Pharmacy and Infectious Diseases
Creighton University

A poster presented at the 2023 ECCMID conference showcased how a network of six Omaha metro area hospitals drove significant antimicrobial stewardship improvements related to treatment for gram-negative bacteremia with the integration and centralization of several diagnostic tools¹.

In 2019, a study concluded that rapid ID and AST solutions, in conjunction with an effective antimicrobial stewardship program, demonstrated a significant reduction in time to isolate results, translating to a significant reduction in the length of antimicrobial therapy and total hospitalization length-of-stay (LOS)². Chris Destache, Pharm.D., FCCP and colleagues aimed to take it a step further in their latest research, determining the impact of changing from a decentralized blood culture system to a centralized system, introducing the bioMérieux BACT/ALERT® VIRTUO® automated blood culture solution. Prior to the implementation of VIRTUO®, potential delays in treatment time for patient care raised concerns as each micro lab would send results through a chain of

communication before the information reached front-line providers. According to Destache, *“Centralized blood culture processing using VIRTUO provided significant improvements in the management of patients with gram-negative bacteremia for time from blood culture draw to treatment change, time from pathogen identification to treatment change, length of optimal antimicrobial therapy, and time to empiric vancomycin de-escalation.”*

Additionally, this shift to a centralized blood culture system improved clinical lab workflow integration with the bioMérieux BIOFIRE® BCID2 Panel, VITEK® MS and VITEK® 2 solutions. *“The VIRTUO is the first step in the ID of the organism,”* says Destache. *“The VIRTUO alarms with a positive blood culture. That culture*

REFERENCES:

¹Chris Destache, PharmD, Dayla Boldt, PharmD, et. al. Impact of centralized bioMérieux BACT/ALERT VIRTUO blood culture system (VIRTUO) implementation on outcomes in patients with gram-negative bacteremia. Poster P1592 33rd ECCMID Copenhagen April 2023.

²Cavaliere SJ, Kwon S, Vivekanandan R, et al. Effect of antimicrobial stewardship with rapid MALDI-TOF identification and Vitek 2 antimicrobial susceptibility testing on hospitalization outcome. *Diagn Microbiol Infect Dis.* 2019;95(2):208-211. doi:10.1016/j.diagmicrobio.2019.05.020

bottle is removed and Gram-stained and streaked on blood agar and chocolate agar plates, and an aliquot is taken to the BIOFIRE BCID2. Plates are incubated and when there is significant growth, it is placed on the VITEK® MS MALDI-TOF. Then AST is performed using the VITEK 2.”

As a member of the Infectious Disease Division and Antimicrobial Stewardship Program (ASP) subcommittee, Destache knows how important it is to get faster results to the ASP team who in turn can more rapidly communicate with clinicians taking care of the patient. Now, a growing body of evidence supports that costs associated with the integration and centralization of microbiology systems may lead to improvements in patient management, mainly, optimal antimicrobial

therapy. In the case of Destache’s latest study, time to optimal therapy was the primary outcome, and for patients with gram-negative bacteremia, where risk of severe sepsis and antimicrobial resistance can be high, time is of the essence.

Implementing new diagnostic and antimicrobial stewardship strategies like centralized blood culture testing and AST requires cross-department collaboration to ensure all team members understand the benefits a process change will bring. Although pharmacists, clinicians, and lab professionals might hold different perspectives, all team members are united by their shared goal to deliver the best care and according to Destache, *“diagnostics can accentuate the relationship.”*