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Blood stream infections cause significant morbidity and mortality. Patient outcomes improve with rapid pathogen identification (ID) and targeted antimicrobial therapy. Given the complexity of GNB antimicrobial resistance (AMR), rapid phenotypic antimicrobial susceptibility testing (AST) can provide a more comprehensive susceptibility profile for targeting antimicrobial therapy than rapid molecular testing for AMR genes. We evaluated the performance of the Qvella™ FAST™ Liquid Colony™ (LC) for rapid ID by VITEK® MS (bioMerieux) and AST by VITEK® 2 (bioMerieux) directly from a positive blood culture (PBC) as compared to the standard of care (SOC) ID and AST from solid media growth. Essential agreement (EA) was determined using the minimum inhibitory concentration for appropriate antimicrobials. Categorical agreement (CA) was determined by a combination of CLSI/EUCAST interpretive criteria and our laboratory’s expert rules.

From 40 GNB PBCs, 39 had concordant ID, 1 had no ID, and no discrepant IDs with LC as compared to the SOC. AST from the LC produced a total of 452 susceptibility results with 99.3% EA and 99.1% CA (4 minor errors (mE) (0.9%); no major (ME) or very major errors (VME)).

To increase diversity of resistance phenotypes evaluated, blood culture bottles (aerobic and anaerobic) were spiked with 14 previously characterized Escherichia coli (n=7) and Klebsiella pneumoniae (n=7) strains, expressing a variety of carbapenemases (n=8) or extended spectrum beta-lactamases (n=4). All 28 isolate IDs matched the expected results. AST from the LC produced a total of 460 susceptibility results with 97.6% EA and 98.9% CA (5 VME (1.9%); no mE or ME. The VME included 3 meropenem results, 2 from a KPC-producing E. coli strain (aerobic/anaerobic bottles) and 1 from an NDM-producing E. coli strain, and 2 TMP-SMX results from an NDM-producing K. pneumoniae strain (aerobic/anaerobic bottles). In all cases these results would not have been reported per lab policies on pending confirmatory testing and reporting rules.

In total, 67 of 68 isolates were correctly IDed with 98.5% EA and 99.0% CA from 912 AST results. There were 4 mE (0.4%) and 5 VME (1.5%). Our results show that accurate rapid ID and phenotypic AST can be reliably obtained from the LC of the Qvella™ FAST™ system.