

The Right Antibiotic at the Right Time:

A Conversation with Jennifer Blakeney MLS(ASCP)^{CM}SM, Lead Technologist, Microbiology/Immunology, Beebe Healthcare



About Beebe Healthcare

Beebe Healthcare serves the Sussex County community with a medical center located in Lewes, Delaware, and outpatient locations in Georgetown, Millsboro, Milton, Millville, and Rehoboth Beach. Founded in 1916, the medical center in Lewes is a 210-licensed-bed, not-for-profit community hospital. Beebe's specialized service lines include cardiac and vascular, surgical services, oncology, women's health, and orthopedic services. Beebe offers an array of inpatient, outpatient, emergency, and diagnostic services.

Implementation of the ePlex System for BCID

Our laboratory went live with ePlex BCID Panels on September 1st, 2019. I have long wanted to bring a molecular blood culture panel into our laboratory, but the cost of the technology was a limiting factor for us. In 2018, our pediatric physicians pushed for the ePlex respiratory panel, and with physician backing, we were able to acquire an ePlex instrument. Once we had the instrument, it was just a matter of time before the ePlex BCID panels were released and we could bring them in.

Before we implemented the ePlex BCID panels we had to wait until the following day to continue the work up with identification and susceptibility testing from the bacterial growth on media. Since the ePlex BCID panels were implemented, we still perform the initial protocol, but we added on the setup of an ePlex BCID panel. Once the ePlex test was complete, we would call the clinician back to let them know that results of the ePlex BCID test were ready to review. So, the clinicians are getting more information much quicker than they had in the past.

Clinical Impact of ePlex BCID Panels

The ePlex system allows our clinicians to rapidly identify bloodstream infections to help optimize antimicrobial therapy much quicker than with our traditional testing. Most of the time this leads to narrowing or tailoring down from broad spectrum antibiotics, decreasing the promotion of drug resistant organisms. This promotes our use of the "right antibiotic at the right time". With the ePlex BCID panels, we have been able to rapidly match bug & drugs. This in turn helps us to make decisions to optimize the most effective drug in a timelier fashion. In addition, with this information, we are able to utilize antibiotics (or combination of antibiotics) that have less potential side effects such as renal injury.

We recently had an unfortunate patient with bacterial meningitis that was complicated by bacteremia. Traditionally we would have had to wait for growth of the organism in the blood cultures and the CSF fluid to identify the organism. With the ePlex BCID panel, we identified the organism (*H. influenzae*) in the patient's bloodstream quickly and were able to tailor antibiotics to the most effective dosage & duration. This in turn helped the patient recover faster with less antibiotic side effects and ultimately led to higher quality, cost efficient care and a faster discharge.

In the laboratory, the ePlex BCID panels have helped us tremendously when it comes to mixed infections. Knowing that there are multiple targets detected can help us with better media selection and incubation conditions. I recall one patient in which the ePlex BCID panel detected seven unique targets, both gram-positive and gram-negative. At first, we thought there might be a contamination issue, but once we had growth the following day, we realized that there were indeed seven different bacterial morphologies noted and we were able to isolate and work with each one. One of the species detected happened to be a slower growing organism, which finally grew after a couple of days extended incubation time. Knowing what to expect in the culture ahead of time has given us an advantage when examining and interpreting growth on media.