EP0291
ePoster Session
Less people, more machines: better results?

Improving time to result with BD Kiestra laboratory automation solution: finding the optimal reading time of urine culture plates with significant growth

Mike Gosnell[1], Mike Brasch[1], Raphael Marcelpoil[2], Didier Morel[2], Joshua Burton[1], Cedrick Orny[2], Maimouna Cisse[1], Tim Wiles[1], Martin Van der Kaap[3], Joost Deutekom[3], Patrick Murray*[4]

[1]*Bd, Sparks, United States*

[2]*Bd, Pont-de-Claix, France*

[3]*Bd, Drachten, Netherlands*

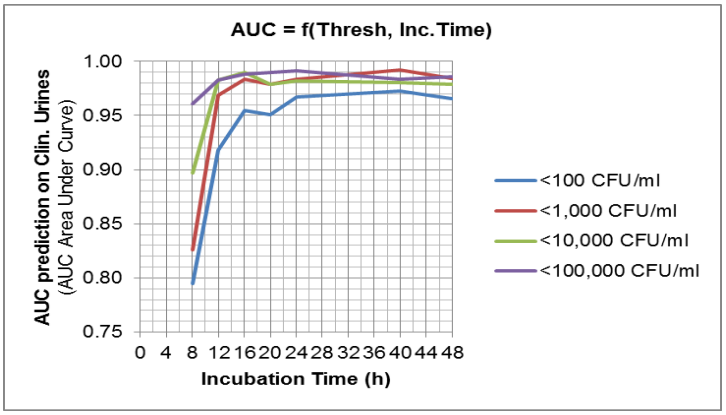
[4]*Bd, Scientific Affairs, Sparks, United States*

Background: The introduction of automation in the clinical microbiology lab improves many of the traditional processes of specimen inoculation, incubation, and further processing of cultures. However, the true value will lay in not only improving laboratory efficiency, but also in providing earlier time to results and the ability to improve patient management. An appropriate criticism of the microbiology lab is there are prolonged delays in the culture process. Automation provides the opportunity to shorten culture time by eliminating delays in transporting inoculated culture plates to incubators, poor circulation of air in incubators due to plate stacking, and removal of plates for extended periods while cultures are processed for identification and susceptibility tests. Additionally, culture plates are traditionally examined by technologists when they are ready to process the plates and not when the plates are ready for processing. For this reason we posed the question – when can inoculated plates be examined to determine if significant growth is present?

Material/methods: For this study, we evaluated urine specimens as they are the most common specimens received in the microbiology lab. The BD Kiestra™ InoqulA+™ was used to inoculate 10 µl of urine onto each of the following BD BBL™ media: TSA II with 5% Sheep Blood, MacConkey II, CHROMAgar, CLED and Columbia CNA Agar with 5% Sheep Blood. Plates were automatically transported to the ReadA™ Compact incubator for incubation in O_2 at 36^{0}C and plate images were taken and automatically interpreted with the BD Kiestra imaging analysis software* at 4-hour intervals between 8 and 24 hours. The time to detection of growth was analyzed for 106 urine specimens, including 36 with no significant growth (<10^4 CFU/ml) and 70 with ≥10^4 CFU/ml (significant growth).

*new image analysis software and expert rules product under development; not available for sale or use.

Results: The accuracy of identifying specimens with no significant growth was: 8 hours – 79.5%; 12 hours – 91.8%; and 16 hours – 95.5%. The accuracy for classifying a specimen as significant growth ≥10^4 CFU/ml was: 8 hours – 89.7%; 12 hours – 98.3%; and 16 hours – 99.0%. Results were not significantly different for the 5 media types.



Conclusions: In these experiments with clinical urine specimens, the use of automated imaging can potentially reduce time for detection of cultures with significant growth and classification of negative specimens.