Introduction:
Implementation of rapid molecular blood culture diagnostics in the clinical management of sepsis is essential in providing fast pathogen identification and resistance gene testing. The Genmark ePlex blood culture panels offer a broad antimicrobial spectrum with minimal hands-on time and around 1.5h time to result. By implementing ePlex analysis when the department of clinical microbiology is closed, the test can be optimally used in terms of clinical impact and costs.

Methods:
Prospective ePlex testing on consecutive non-duplicate positive blood cultures, primarily from the emergency room, incubated at a satellite incubator at the 24h/7day open department of Clinical Chemistry. The routine biomedical analysts performed the analyses. The result, except findings of CoNS, was made available to the attending physician. Cultures were transferred to the Department of Clinical Microbiology for conventional diagnostics the next day. The ePlex results were compared to conventional diagnostics for pathogen identification and time to result. The clinical impact was assessed by investigation of the patients’ medical records.

Results:
Forty-four cultures were analyzed with ePlex. Complete agreement with conventional diagnostics was observed in 38/44 cases. No false-positive results were observed, yielding a sensitivity and specificity of 90% and 100% respectively for target pathogens. Time to result was, on average, 10.4 h faster with ePlex compared to conventional diagnostics. Antimicrobial therapy could have been optimized in 5 patients based on the ePlex result, but treatment was only changed in one case (E.coli CTX-M+) receiving meropenem 8.5 h before the antibiogram was available.

Conclusion:
The ePlex blood culture panels provide high accuracy and significantly faster results. The current implementation offers substantial potential value at a minimal cost, and is a feasible approach to 24-h/7 days blood culture diagnostics in many hospital settings. However, efforts to increase adherence are needed.
Figure 1. Result of consecutive positive blood cultures analyzed with ePlex

- 44 consecutive blood cultures+ → 2 no target(ePlex) /negative culture
- 42 blood stream infections (BSI) → 1 ePlex non-target pathogen(E. lenta)
- 36 agreement ePlex/culture sensitivity 90% specificity 100%
- 6 isolates not detected by ePlex(2 E.coli, 1 Salmonella spp, 1 C.albicans, 2 CoNS*)
- 1 patient received Meropenem due to ePlex-result (E.coli CTX-M+) 8.5h before antibiogram result
- 4 patients on inadequate treatment could have benefitted from the ePlex-result on average 9.8h earlier.

*Polymicrobial infection with S.mitis