Prospective studies evaluating the impact of antibiotic therapy (ABX) in septic patients, there is an average 7.6% decrease in survival. For every hour delay in the initiation of appropriate antimicrobial therapy (ABX) and antimicrobial susceptibility (AST) can delay prescription of optimal therapies.

Methods
• Among the methods compared, AXDX has generated the shortest ID and AST TATs with the potential to improve laboratory TATs, with subsequent improvements in clinical outcomes such as mortality and hospital length of stay. Furthermore, rapid microbiology results have been shown to lead to earlier de-escalation of ABX in conjunction with an antimicrobial stewardship program (ASP).

The Accelerator PhenoTM system (Accelerate Diagnostics, USA) (AXDX) is a fully-automated, rapid diagnostic system that is used directly on positive blood cultures. It performs: • Gel electrophoresis and fluorescence in situ hybridization for ID • Automated microscopy for observation of bacterial growth and extracellular products for AST

Objective: Our laboratory evaluated the potential clinical impact of AXDX by reviewing ABX changes made by physicians as Gram stain, ID, and AST results are released.

Results
• For every hour delay in the initiation of appropriate antimicrobial therapy (ABX) and antimicrobial susceptibility (AST) can delay prescription of optimal treatments.

Conclusion: AXDX generated the shortest ID and AST TATs with the greatest potential to significantly shorten the time to ABX tailoring in Gram-negative bacilli bloodstream infections thereby impacting patient outcomes.

Table 1. Blood culture isolates and patient locations (n=70)

<table>
<thead>
<tr>
<th>Blood Culture Isolates</th>
<th>Patient Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. aeruginosa</td>
<td>ER</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Medicine</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>ICU</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>Surgery</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>Transplant Unit</td>
</tr>
</tbody>
</table>

Figure 1: Changes in antibiotics ordered for Gram-negative bloodstream infections following Gram stain, ID, and AST results.

Figure 2: Time to actual and potential antibiotic tailoring by varied ID and AST methods

*AXDX TATs and all Potential Method TATs were statistically significant compared to Current Method TATs (P <0.0001, 1-tail).

A review of 239 non-AXDX study blood cultures in our laboratory revealed this would result in minor errors 0.4% of the time, major errors 1.3% of the time, but no very major errors.
References


