### Evaluation of GBS Detect™: A New Medium for the Detection of Non-Hemolytic Group B Streptococci (GBS) in Subcultures of Carrot Broth™ and LIM Broth. Results of a Multi-Center Trial

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### Revised Abstract

Detection of Group B Streptococcus (GBS) colonization in pregnant women is critical for the prevention of postpartum neonatal and maternal disease. The most sensitive culture methods utilize enrichment broth procedures and the most commonly used methods are Step B Carrot Broth™ and LIM Broth. Both of these broths contain an ingredient utilizing the organism’s ability to produce a visible orange pigment. Parental production and detection of this pigment is unique to GBS, therefore negative Step B Carrot Broth™ specimens must be subcultured to Blood Agar. This procedure results in colonies that are not alpha, beta, or gamma hemolytic and are distinguishable from other non-hemolytic colonies. Sensitivity of this method is dependent upon the use of an appropriate subculture medium to accurately identify GBS from other non-hemolytic strains. In addition, only when using GBS Detect™ plates, all samples were confirmed as GBS using latex agglutination. Compared to Blood Agar, GBS Detect™ was able to detect 34 additional colonies of GBS that would otherwise have been deemed negative by this conventional method. Based on these findings, GBS Detect™ can be utilized as a reliable method to complement a Step B Carrot Broth™ and ultimately reduce the work load and time necessary to accurately identify GBS in pregnant women.

### Materials and Methods

**Participating centers**

- *Bartheldus Oak Hospital, Cincinnati, Ohio*
- *Aurora Health Care, Milwaukee, Wisconsin*
- *Columbia - St. Mary’s, Milwaukee, Wisconsin*
- *Central Coast Pathology, San Luis Obispo, California*
- *Bluebonnet Laboratories, Abbott Northwestern Hospital, Minneapolis, Minnesota*
- *Kaiser Permanente Central Laboratory, Berkeley, California*

**Study design**

This study was conducted between November 2007 and April 2008. Patient eligibility and sample collection

- **Patient eligibility and sample collection**
  - *Pregnant patients between 33 – 37 weeks gestation were eligible for GBS screening*.
  - *Screening from the lower vagina (jugular introitus) and rectum were collected, transported to the laboratory with appropriate transport media (S. aureus or Arctos®) and inoculated into either LIM Broth or Step B Carrot Broth™.*

**Microbiological Analysis**

- **LIM Broth**
  - *All LIM Broths were subcultured after the 18 to 24 hour incubation period to 5% Sheep Blood agar for confirmation and to a GBS Detect™ Plate.*
  - *All colonies suggestive of GBS were confirmed by CAMP test or latex agglutination.*

- **Step B Carrot Broth™**
  - *The Step B Carrot Broth™ tubes were aerated for 24 hours at 37°C, then inoculated onto Blood Agar plates and a Blood Agar plate containing 5% sheep blood.*
  - *All colonies suggestive of GBS were confirmed by latex agglutination.*

### Results and Data Analysis

Results from each method were independently recorded by the different technologists who performed the testing. These results were then analyzed by the study coordinator. Results are summarized in the table below.

**Table 1. Overall Results of GBS Detect™ vs. Blood Agar, Multi-Clinic Trial Study**

<table>
<thead>
<tr>
<th>Study duration</th>
<th>Blood Agar</th>
<th>GBS Detect™</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 weeks</td>
<td>619</td>
<td>107</td>
</tr>
<tr>
<td>36 weeks</td>
<td>83</td>
<td>24</td>
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<td>36 weeks</td>
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<td>0</td>
</tr>
<tr>
<td>36 weeks</td>
<td>62</td>
<td>6</td>
</tr>
</tbody>
</table>

**Conclusion**

GBS Detect™ medium recovered significantly higher numbers of nonhemolytic GBS isolates from cultures of traditional enrichment broths than Blood agar plates or equivalent. GBS Detect™ also demonstrated significantly higher sensitivity than Step B Carrot Broth™ and Streptococcus that would otherwise have been missed using conventional methods. Based on this finding, GBS Detect™ can be utilized as a reliable method to increase the sensitivity of traditional culture based GBS detection methods. In conclusion, GBS Detect™ medium against conventional plating methods is a straightforward method of detection is inexpensive, and cost-effective for the detection of GBS in pregnant women.