PHYSICIAN UPDATE

Lamellar Body Count Replaces S/A Ratio
Rapid Method to Assess Fetal Lung Maturity

SUMMARY

Effective October 19, the Lamellar Body Count (LBC) test will be performed on amniotic fluid, replacing S/A ratio testing which has been discontinued by the manufacturer.

BACKGROUND

Fetal lung maturity (FLM) testing is performed on amniotic fluid to evaluate the risk to fetal health of early delivery. If testing identifies low fetal lung surfactant levels, a high risk of respiratory distress is predicted and treatment options such as maternal steroid administration and neonatal surfactant therapy can be employed. The American College of Gynecologists (ACOG) recommends FLM testing whenever an elective delivery is planned before 39 weeks of gestation.¹

PeaceHealth Laboratories has offered this test using an S/A ratio screen, with supplemental testing of abnormals by L/S Ratio and Phosphatidylglycerol (PG). The sole vendor of the S/A Ratio reagents has announced that they will withdraw from this market, which is requiring laboratories across the U.S. to seek alternate methods for FLM.

WHY LAMELLAR BODY TESTING?

The emerging new method-of-choice is Lamellar Body (LB) testing. Lamellar Bodies are the storage form of lung surfactant in the fetal lungs. As the fetal lungs mature, LB’s are shed into the amniotic fluid. LB’s are produced in a tight size range approximating that of platelets and can be measured rapidly and with high precision (<5% CV) using standard hematology analyzers.²

Transmission electron microscopy photomicrograph of Lamellar Bodies. Photo courtesy of Ann Gronowski, PhD³

BENEFITS

- Faster turnaround time: Available daily with 1 hour STAT reporting time
- Lower cost: Significantly less expensive than surfactant/albumin (S/A) ratio and lecithin/sphingomyelin (L/S Ratio) phosphatidyl glycerol (PG) testing
- Equivalent quality: Equivalent sensitivity and specificity to L/S Ratio and PG testing

continued on next page
Clinical studies have been published showing similar clinical performance between LB and L/S Ratio and PG testing with a normal result indicating 97-98% probability of maturity and abnormal low value indicating 29-35% probability of immaturity.

The cutoff for maturity with LB testing has been reported as 50 K/µL in multiple studies. PeaceHealth Laboratories has confirmed this by correlating S/A ratio values to LB values in 60 amniotic fluids submitted for testing. A linear regression of these values demonstrates that the SA maturity cutoff of 55 mg/gm is equivalent to a 50 K particles/µL LB count, supporting the published cutoff value.

**Correlation: SA Ratio to Lamellar Body Counts**

\[
r = 0.715  \\
(SA \text{ Ratio} \times 1.178) - 14.78 = LB \text{ Count}  \\
n = 60  \\
LB \text{ Counts performed on Sysmex XE-2100}  \\
\]

- **Maturity cutoff** = 55 mg/gm \(SA \text{ Ratio} = 50.01 \text{ LCB}  \\
This is consistent with the published LBC cutoff for maturity of 50 K/µL.
QUESTIONS?
If you have questions, please contact:

Daniel Kerrigan, MD
Hematopathologist
📞 541-687-2134 ext. 8036
📞 541-341-8036
dkerrigan@peacehealthlabs.org

Deven Smith, MD
Hematopathologist
📞 541-687-2134 ext. 8284
📞 541-984-8289
dsmith@peacehealthlabs.org

Michael Suter, MT(ASCP), SH
Technical Specialist, Hematology
📞 541-687-2134 ext. 8182
📞 800-826-3616 ext. 8182
msuter@peacehealthlabs.org

Gary Sandberg, MT(ASCP), SC
Technical Operations Manager,
Bellingham Laboratory
📞 360-788-6300 ext. 2965
gsandberg@peacehealthlabs.org

REFERENCES
Lamellar Body Count (continued)

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>ORDER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>22000</td>
<td>Lamellar Body Count, Amniotic Fluid</td>
</tr>
<tr>
<td>Replaces:</td>
<td>45170 S/A Ratio Only</td>
</tr>
</tbody>
</table>

LBC Replaces S/A Ratio in the Following Panels:

- **45150 Fetal Lung Maturity Cascade**
  - Note: Initial test to determine fetal lung maturity will be the Lamellar Body Count, replacing the S/A Ratio. Only immature Lamellar Body Counts will reflex to L/S Ratio and PG.

- **45180 Fetal Lung Maturity Profile**: Includes S/A Ratio, L/S Ratio and PG.
  - Note: S/A Ratio in this profile will be replaced with Lamellar Body Count

**Methodology:**
Automated hematology analyzer using impedance particle counting

**Performed:**
Daily

**Released:**
Same day as tested

**CPT Code:**
83664

SPECIMEN REQUIREMENTS

**Collect:**
Amniotic fluid

**Handling:**
Do not centrifuge. Refrigerate. Do not freeze. Indicate source if not amniotic fluid (e.g., vaginal pool)

**Stability:**
7 days refrigerated, unstable frozen

**Standard Volume:**
1 mL

**Minimum Volume:**
0.5 mL

**Transport:**
Refrigerated (preferred) or ambient

**Rejection Criteria:**
Specimen that is grossly bloody or contains meconium. Frozen specimen. Vaginal pool specimen containing mucous.

**Retention:**
7 days

**Comment:**
Sample with red blood cell counts >0.031 M/µL will not be reported