Legacy Laboratory Services

Fetal Lung Maturity by Lamellar Body Counts

December 2011

On December 20, 2011, Legacy Laboratory Services will introduce Lamellar Body Counts (LBC). LBCs in amniotic fluid aid in the determination of fetal lung maturity. Lamellar bodies are concentrically layered packages of phospholipids that are produced by Type II alveolar cells, representing the storage form of surfactant. As gestational age increases, LBCs increases. Lamellar bodies are approximately the same size and density as platelets. Due to their similar size, lamellar bodies can be counted on most hematology cell counters providing a quick, accurate evaluation of fetal lung maturity.

The following table compares LBC to our current testing used to determine fetal lung maturity. LBCs perform at least as well as Lecithin/Sphingomyelin Ratio (L/S Ratio) and Surfactant/Albumin Ratio (otherwise known as FLM). We will continue to offer L/S Ratios on a limited basis (see our website for more information). **However, Surfactant/Albumin Ratio is being discontinued by the sole manufacturer and will no longer be available as of early 2012.**

Lamellar Body Count $\geq 46 \times 10^3$ LBC/μL indicates fetal lung maturity.

Table I: Common Tests Used in Diagnosing Fetal Lung Maturity

Analyte	Lamellar Body Count	Lecithin/ Sphingomyelin Ratio	Phosphatidylglycerol (PG)	Surfactant/ Albumin Ratio (discontinued 2012)
Legacy LIS Mnemonic	LBC	LS RATIO	LS RATIO	FLM
Method	Automated Cell Counter by Impendence	Thin Layer Chromatograp hy	Thin Layer Chromatography	Fluorescence Polarization
TAT	<1 hour	4-5 hours or more	4-5 hours or more	<1 hour
Sensitivity[1]	92-100%	83-100%	83-100%	96-100%
Specificity[2]	60-89%	60-87%	73-88%	70-72%
Positive Predictive Value[3]	36-54%	19-53%	23-50%	24-36%
Negative Predictive Value[4]	98-100%	86-100%	97-100%	99-100%

1.) Sensitivity: percentage of babies with immature lungs (respiratory distress syndrome, RDS) who were correctly identified. 2.) Specificity: percentage of babies with mature lungs who were correctly identified. 3.) Positive Predictive Value: Fraction of positive tests (immature lungs) that were true positives (true immature lungs). 4.) Negative Predictive Value: Fraction of negative tests (mature lungs) that are true negatives (true mature lungs).

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Collection Guidelines

Description	Lamellar Body Counts
Order Code	LBC
Collect	Amniotic fluid collected via trans-abdominal amniocentesis, one sterile container.
Handling	Keep the specimen refrigerated (2-8°C). Do not freeze specimen. Do not let specimens sit directly on cold packs. Insulate specimen with bubble wrap or other appropriate packing material when shipped cold.
Preferred Volume	5.0 mL amniotic fluid (10.0 mL amniotic fluid if requesting L/S Ratios)
Minimum Volume	1.0 mL amniotic fluid
Transport	Refrigerated (2-8°C)
Rejection Criteria	The following amniotic fluid specimens will not be accepted for lamellar body count testing. • Frozen specimens • Centrifuged specimens • Filtered specimens • Visible blood or hemolysis • Specimens contaminated with meconium • Vaginal pool specimens • Highly viscous specimens • Specimen containing clots that cannot be removed
Stability	Temperature / Time Period Ambient (20-25°C) / 24 hours Refrigerated (2-8°C) / 8 days Frozen (≤ -20°C) / unacceptable
Reference Ranges	LBC/μL / Interpretation ≥ $46x10^3$ / Mature $15 x10^3$ to $45 x10^3$ / Immature/Indeterminate, recommend further testing $0-14 x10^3$ / Immature

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