



TECHNICAL NOTICE

SOUTH BEND MEDICAL FOUNDATION

March 2009

Lamellar Body Counts in Amniotic Fluid

Effective Date: March 1, 2009

Performing Department: Hematology

Use: Assessment of fetal lung maturity (FLM)

Clinical Significance:

The pulmonary system is one of the organs that matures later in fetal development. An immature pulmonary system cannot adequately oxygenate the neonate, therefore significant neonatal morbidity and mortality results from preterm birth.

Establishing fetal lung maturity is often the deciding factor before iatrogenic preterm delivery.

Fetal lung maturity is controversial in non-elective deliveries. After 37 weeks of gestation, the risk of respiratory distress syndrome (RDS) is very low, thus FLM testing is usually not performed if physicians feel prolonging pregnancy will place mother and fetus at high risk. Prior to 32 to 34 weeks of gestation, the prevalence of neonatal morbidity from prematurity is high and assessing FLM does not substantially alter obstetric management. However, FLM assessment can be useful in managing complicated pregnancies in the gestational age range of 34 to 37 weeks.

Discussion:

The three tests offered by SBMF to facilitate FLM assessment are:

1. Lecithin/Albumin (L/A) Ratio, by Fluorescence Polarization..... Test #: 23801

This method is a true direct measurement of surfactant concentration. Results that are greater than 55 have been shown to correlate with the presence of fetal lung maturity. The accuracy of this test compares favorably with the well established Phosphatidylglycerol and Lecithin-Sphingomyelin Ratio tests. But this method is subject to interference by the presence of blood and meconium in the amniotic fluid sample.

2. Phosphatidylglycerol (PG), by Immunologic Agglutination Test #: 23802

PG is a minor constituent of surfactant. Its concentration begins to rise appreciably in amniotic fluid several weeks after the rise in lecithin. PG determination is not affected by blood and meconium commonly found in amniotic fluid samples.

3. Lamellar Body Counts (LBC), by Fluorescence Flow Cytometry Test #: 25150

LBC is a direct measurement of surfactant production by type II pneumocytes. Measurement by a hematology instrument, Sysmex XE2100, is based on similarity in size of LBC and platelets. Results that are less than 15,000/ μ L suggest immaturity, results that are greater than 50,000/ μ L suggest pulmonary maturity.

LBC can be performed quickly and at a lower cost than L/A and PG tests. Data from several studies showed that results of LBC and L/A showed comparable outcome in the prediction of RDS.

Most of methods for FLM assessment have similar accuracy and are better at predicting the absence, rather than the presence, of RDS. It is common to observe discordant results when more than one test is ordered. In this case, the least reassuring result probably should be used to guide obstetric management if a delay in delivery is possible.

Reference Range:

Lamellar Body Counts:

- Mature Lung: Equal to or greater than 50,000/ μ L
- Transitional Lung: 15,000 to 49,000/ μ L
- Immature Lung: < 15,000/ μ L

Specimen Requirements and Collection:

Preferred Specimen: • Amniotic fluid (amniocentesis fluid preferred) in sterile plastic tube with screw-top cap

Requested Volume: • 2.0 mL

Minimum Volume: • 1.0 mL

Processing: • Do not centrifuge • Do not freeze

Stability: • 1 week room temperature (20-30°C) • 1 week refrigerated (2-8°C) • Frozen (-20°C): Unacceptable

Storage/Transport: • Room temperature or refrigerated

Causes For Rejection: • Sample containing obvious mucus or meconium • Bloody or frozen sample

Testing Schedule: • Sunday-Saturday (daily) • Performed upon sample receipt; results available within 1 hour

Order: • Lamellar Body Counts, Amniotic Fluid.....Test #: 25150.....CPT: • 83664

Please direct questions or comments regarding this notice to William J. Kaliney, M.D., Deborah H. Sun, Ph.D., or Brett Colter of South Bend Medical Foundation, (574) 234-4176 or (800) 544-0925.

SOUTH BEND MEDICAL FOUNDATION

530 N. Lafayette Boulevard • South Bend, IN 46601 • (574) 234-4176

Elkhart (574) 293-8441 • (800) 544-0925

Robert J. Tomec, M.D. • *Medical Director*