**Section 661.30 Interpretation of Results**

Although the majority of infants affected by disorders included in the newborn screening panel will be identified by this screening, due to genetic variabilities and variations in health status, specimen quality, and timing of specimen collection, not all infants affected by a disorder may be identified. As with any laboratory test, false positive and false negative results are possible. Newborn screening test results are insufficient information on which to base diagnosis or treatment. Tests will be conducted at a *Department of Public Health laboratory designated to perform* the *tests* (Section 2(e) of the Act), as follows:

a) Phenylketonuria

1) Normal phenylalanine levels shall be established using accepted statistical techniques.

2) When the blood phenylalanine level is deemed to be abnormal, the Department will recommend a repeat newborn screening test or referral of the infant to a designated medical specialist for a quantitative phenylalanine determination and other diagnostic studies as determined by the medical specialist.

b) Primary Hypothyroidism

1) Neonatal levels for thyroid stimulating hormone (TSH) vary with gestational age, birth weight, time of collection and in response to concurrent medical problems. Normal TSH and normal thyroxine (T4) levels shall be established using accepted statistical techniques.

2) When the TSH level or the T4 level is deemed to be abnormal, the Department will recommend a repeat newborn screening test or referral of the infant to a designated pediatric endocrinologist for further evaluation for primary hypothyroidism and additional serum testing for thyroid function.

c) Galactosemia

1) Laboratory tests for galactosemia may be performed by testing for total galactose (galactose and galactose-1-phosphate) or a deficiency of the galactose-l-phosphate uridyl transferase enzyme. Normal test results indicate a normal level of total galactose or the presence of the enzyme. Test results are abnormal when the level of total galactose is above the normal range or the presence of the enzyme is not detected. Normal ranges shall be established using accepted statistical techniques.

2) When the galactose or enzyme levels are deemed abnormal, recommendations may be given to change the diet of the infant to a galactose free diet. The Department will recommend a repeat newborn screening test or referral of the infant to a designated medical specialist for further diagnostic studies.

d) Congenital Adrenal Hyperplasia (secondary to 21-hydroxylase deficiency)

1) Neonatal levels for 17-hydroxyprogesterone vary with gestational age, birth weight, time of collection and in response to concurrent medical problems. Normal 17-hydroxyprogesterone levels shall be established using accepted statistical techniques.

2) When the 17-hydroxyprogesterone level is deemed to be abnormal, the Department will recommend a repeat newborn screening test or referral of the infant to a designated pediatric endocrinologist for further evaluation for congenital adrenal hyperplasia.

e) Biotinidase Deficiency

1) Laboratory tests for biotinidase deficiency are designed to detect a deficiency of the biotinidase enzyme. Normal test results indicate the presence of the enzyme. Test results are abnormal when the presence of the enzyme is not detected.

2) When the determination of the enzyme is deemed abnormal, the Department will recommend a repeat newborn screening test or referral of the infant to a designated medical specialist for a quantitative determination of the biotinidase enzyme and further diagnostic studies.

f) Sickle Cell Disease/Trait and Other Hemoglobinopathies

Qualitative testing will determine the presence of A, F, S, C and other hemoglobins.

1) When F and S hemoglobins, but no A hemogolobin, are detected on the same specimen, the Department will recommend referral to a designated medical specialist for follow-up and genetic counseling.

2) When F, S and C hemoglobins, but no A hemogolobin, are detected on the same specimen, the Department will recommend referral to a designated medical specialist for follow-up and genetic counseling.

3) When F, A and C hemoglobins or F, A and S hemoglobins are detected on the same specimen, the Department will recommend parental testing and genetic counseling by the attending physician or another qualified counselor.

4) When A hemoglobin is detected as the predominant hemoglobin, and the specimen was collected at less than two months of age, the infant will be assumed to have received a blood transfusion, and a report indicating that the infant received a blood transfusion will be made. A repeat newborn screening specimen should be drawn from all such infants three months post-transfusion.

g) Phenylketonuria (PKU) and Other Amino Acid, Organic Acid, and Fatty Acid Oxidation Disorders (PKU testing is described in Section 661.30(a).)

1) Analysis shall be performed by MS/MS. The patient metabolite distribution patterns shall be compared to normal populations. Pattern analysis, and internal metabolite ratios relative to normal populations, shall be calculated using accepted statistical techniques.

2) When blood levels or ratios are found to be abnormal, indicating the possibility of a metabolic condition harmful to the infant, the Department will recommend a repeat newborn screening test or referral of the infant to a designated medical specialist for appropriate definitive testing and diagnostic studies.

h) Cystic Fibrosis (CF)

1) CF is indicated by elevated neonatal levels of immunoreactive trypsinogen (IRT) that can be detected in dried blood spots by immunoassay or other techniques. The normal IRT range shall be established using accepted statistical techniques.

2) When elevated levels of IRT are detected, testing by genetic mutation analysis shall be performed in order to decrease false positive results. Because there are over 1,000 mutations in the CF transmembrane conductance regulator (CFTR) gene, testing will yield only 90 to 95 percent sensitivity.

3) When IRT levels and/or mutation analysis are found to be abnormal, thus indicating the possibility of CF, the Department will recommend referral of the infant to a designated medical specialist for appropriate definitive testing and diagnostic studies.

i) Lysosomal Storage Disorders (LSDs)

1) An LSD can be detected in dried blood spots by using tandem mass spectrometry or other methods. Normal testing parameters shall be established using accepted statistical techniques.

2) When testing parameters are found to be abnormal, thus indicating the possibility of an LSD, the Department will recommend referral of the infant to a designated medical specialist for appropriate definitive testing and diagnostic studies.

3) After an initial phase-in project to establish normal testing parameters and validate the screening, all specimens submitted to the Illinois Department of Public Health Newborn Screening Laboratory will be tested for LSDs.

j) Severe Combined Immunodeficiency (SCID)

1) SCID can be detected in dried blood spots by using DNA-based methods, such as polymerase chain reaction (PCR) or other methods. Normal testing parameters shall be established using accepted statistical techniques.

2) When testing parameters are found to be abnormal, thus indicating the possibility of SCID, the Department will recommend referral of the infant to a designated medical specialist for appropriate definitive testing and diagnostic studies

3) To establish normal testing parameters and validate the screening technique, a phase-in project will be conducted for a six-month period after January 1, 2012, and will require SCID screening of all babies born at a small group of birthing hospitals to be designated. At the conclusion of the phase-in project, all specimens submitted to the Illinois Department of Public Health Newborn Screening Laboratory will be tested for SCID.

(Source: Amended at 36 Ill. Reg. 1753, effective January 19, 2012)