Lab Dept:	**Chemistry**
Test Name:	**NEWBORN METABOLIC SCREEN, WISCONSIN**

General Information

Lab Order Codes: WNBS

Synonyms: Wisconsin Newborn Screen; Newborn Screen Wisconsin

CPT Codes: N/A

Test Includes: The newborn screening panel includes tests for the following 48 disorders:

- Argininosuccinic Acidemia (ASA)
- Biotinidase Deficiency
- Congenital Adrenal Hyperplasia
- Congenital Hypothyroidism
- Citrullinemia (Types I & II)
- Cystic Fibrosis
- Fatty Acid Oxidation Disorders (11)
- Galactosemia
- Hemoglobinopathies (Sickle Cell, Hgb S, Beta Thalassemia, Hgb S/C, other variants)
- Homocystinuria
- Hypermethioninemia (see PKU)
- Hyperphenyalaninemia
- Maple Syrup Urine Disease
- Organic Acidemias (12)
- Phenylketonuria (PKU)
- Severe Combined Immune Deficiency (SCID)
- Tyrosinemia (Types I,II, & III)

Logistics

Test Indications: State of Wisconsin requires newborn screening for common metabolic disorders or disease states which can lead to clinical consequences such as mental retardation, hemolytic episodes, and death.

Lab Testing Sections: Chemistry - Sendouts

Referred to: Wisconsin State Laboratory of Hygiene

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550

Test Availability: Performed Monday through Saturday

Turnaround Time:

Specimen analysis begins on the day specimens are received in the newborn screening laboratory. The availability of results is disorder dependent.

- Specimens with all normal results are reported within 48 hours.
- Abnormal results for Galactosemia and Congenital Adrenal Hyperplasia are available on the day of sample receipt.
- Abnormal results for Aminoacidopathies, Congenital Hypothyroidism, Fatty Acid Oxidation and Organic Acidemia disorders are generally available in 24 hours.
- Hemoglobinopathies and abnormal Biotinidase results are available in 48 hours.
- Abnormal Cystic Fibrosis results are available in three to five days.

Special Instructions:

When to Collect a Specimen

Full-Term Infants:

Collect sample before discharge from hospital of birth, as mandated by statute. If initial sample was collected before 24 hours of age, obtain repeat sample in about 14 days, as recommended by the American Academy of Pediatrics. (Pediatrics, Vol. 89 No. 2, Feb. 1992)

Home/Out-of-Hospital Births:

The Newborn Screening Statute applies to all births in Wisconsin. The birth attendant (physician, midwife, or nurse certified under 441.15) is responsible for collecting a sample before one week of life for out-of-hospital births.

Extended Hospital Stays (Low Birth weight/Sick Infants):

Collect specimen by the seventh day of life unless a transfusion is imminent (see below). For birth weight below 2,200g collect 2nd specimen around 2 weeks of age, a 3rd around 30 days and monthly thereafter until discharge. Should any of the collections occur post-transfusion, follow re-testing guidelines on the laboratory report. For babies weighing more than 2,200g and hospital stays greater than 14 days re-test at time of discharge or at one month of age if hospital stay is longer than one month.

NOTE: Always collect a newborn screening specimen (filter paper) at discharge unless the previous specimen was collected within 6 days of discharge.

Transfused Infants:

Collect initial sample before transfusion, if possible.

- If sample is collected before transfusion and less than 24 hours of age, repeat testing at 30 and 60 days of life.

- If initial sample was collected post-transfusion, testing should be done at 6, 30, and 60 days of life. Always list date of most recent transfusion on sample collection card.

Transferred Infants:

If transfer to another hospital is imminent, collect sample before transfer, if at all possible. Be sure to inform the receiving hospital of collection status, including whether or not the sample was collected, age at time of collection, transfusion status, etc.

Parent Refusal of Newborn Screening Testing:

Parents may refuse newborn screening testing of their baby ONLY "on the grounds that it conflicts with their religious tenets and practices". Parents refusing under this condition should sign a statement that is placed in the infant's medical record.

Specimen

Specimen Type:	Whole blood
Container:	Wisconsin Newborn Collection Form
Draw Volume:	0.5 mL blood
Processed Volume:	Same as Draw Volume

Collection:

To prevent specimen contamination, do not touch any of the filter paper circles before or after collection.

1. Select puncture site and cleanse with 70% isopropanol. See diagram on collection form

2. Use a sterile, disposable lancet with 2.0 mm, or less, point to perform a swift, clean puncture.

3. Keep heel in horizontal position (Heel Down) at or below heart level.

4. Wipe away the first blood drop.

5. Allow a second **large** blood drop to form and apply to surface of filter paper circle. If not completely filled, add a second large drop immediately. **Note**: Heparinized capillaries can be used to apply blood to the filter paper. Apply blood immediately upon filling and do not touch the filter paper surface with the capillary. Do not use blood collection devices that contain EDTA.

6. Fill all required circles. **Fill** from only one side of the filter paper. Circles must be completely filled when observed from both sides of the filter paper.

7. If problem occurs during collection, repeat collection using another form. Original form can be returned for replacement.

8. After blood has been applied to the filter paper forward the collected specimen to the lab.

Special Processing: Lab Staff: After blood has been applied to the filter paper proceed as follows:

- Allow blood-soaked collection card to dry in a horizontal (flat) position.
- Suspend blood-soaked area of collection card such that air can dry both sides of the card equally.

Note: Be sure the attached coverslip doesn't come into contact with the blood until completely dry. Do not allow the blood-soaked portion of the collection card to come into contact with another surface (desktop, absorbent paper, etc.)

- Allow blood to air dry at room temperature for a minimum of three (3) hours.

Note: Do not use artificial heat (lamps, incubators, etc.) to dry the samples.

- Evaluate specimens for acceptability.
- Replace the coverslip over the blood when completely dry.

Mailing of Specimens:

- Mail specimens as soon as possible after drying.

Do Not batch specimens from multiple days except on Sunday.

Note: Specimens older than seven (7) days from collection date are unsatisfactory for testing and a repeat collection will be requested.

- Place specimen(s) to be mailed in the United Parcel Service (UPS) mailer.
- For those hospitals using Internet shipping, print and enclose (in the outside pocket) the shipping document (i.e. shipping label).
- UPS shipping costs will be paid by the WSLH.
- Most institutions have a daily UPS pick-up. Make sure the UPS mailer gets to the appropriate department in time for the pick-up. If your institution does not have a daily pick-up, call (800) 742-5877 and ask for an "on demand" pick-up.

Patient Preparation: None

Sample Rejection: Blood clots on surface of collection form, Incomplete saturation of collection form, damage to collection form, blood layered on surface of form, blood applied on both sides of form, sample submission delay of > 7 days, Contamination, Blood on the Tan outer cover of form, and Quantity not sufficient.

Interpretive

Reference Range: Normal

Interpretation Process:

Normal Results (White paper):

- Written report to sample collection institution.
- Repeat of individual disorders: Written report to physician and collection institution.

Definite Abnormal (Gold colored paper):

- Telephone call to baby's physician.
- Written report to baby's physician and collection institution.

Possible Abnormal (Blue colored paper):

- Written report to baby's physician and collection institution.
- Note: Some possible abnormal thyroid results are also reported by telephone to the baby's physician.

Critical Values: See Reference range Interpretation Process

Limitations: N/A

Methodology: Specific to test performed. For more information see Wisconsin State Laboratory of Hygiene website.

References: Wisconsin State Laboratory of Hygiene