Fact Sheet for Healthcare Providers (Early Check and elevated CKMM)

North Carolina is conducting a pilot study to screen newborns for Duchenne muscular dystrophy (DMD) and related neuromuscular conditions.

The National Institutes of Health has awarded a contract to the following organizations to gather additional information about the technical aspects of screening for a small panel of health conditions currently not included in standard newborn screening:

- RTI International
- University of North Carolina at Chapel Hill (UNC-CH)
- Duke University
- Wake Forest School of Medicine
- North Carolina State Laboratory of Public Health

Since 2018, Early Check has performed voluntary laboratory testing and provided follow-up for infants who screen positive for conditions on the Early Check panel. The free screening is done using the dried blood spot that remains after standard newborn screening.

Brief Overview of Early Check

Early Check is a statewide, voluntary research study that aims to support the health of newborns and families in North Carolina. The goal of Early Check is to learn about rare health conditions and to look for better treatments to help babies who have these conditions.

Pregnant women in their second or third trimester who plan to give birth in North Carolina are eligible to participate in the Early Check study. Mothers of newborns up to 1 month old are also eligible. The consent process occurs entirely through the Early Check secure online permissions portal and is completely voluntary. Parents who do not enroll prenatally will receive an invitation letter from the North Carolina Division of Public Health postnatally.

Early Check screens newborns for a small number of conditions including **Duchenne muscular dystrophy (DMD) and related neuromuscular conditions.**

In the case of a positive screen result, an Early Check genetic counselor will call the family to relay the result and to coordinate confirmatory testing. If a diagnosis is made, Early Check provides genetic counseling, a clinical research visit at Duke or UNC-CH with a condition-specific medical specialist, ongoing developmental assessments, and recommendations for clinical care. The screening report and diagnostic test results will be provided to the parents and to their pediatrician upon parental request.

Elevated CK-MM and Muscular Dystrophies

Elevated Creatine Kinase MM isoenzyme (CK-MM) can be an indication of muscle damage and has been associated with Duchenne muscular dystrophy; however, the false positive rate for CK-MM screening is estimated to be greater than 50%.

Confirmatory Testing

Gene panel: Early Check provides genetic counseling to explain the screening results and coordinates free confirmatory testing, with no charge to parents or insurance. With parental consent, Early Check will send their newborn's residual blood sample from the Early Check screening tests for genetic testing to Perkin Elmer Genomics. They will perform next generation sequencing of a large panel of genes associated with neuromuscular conditions. If the dried blood spot sample is not sufficient for genetic testing, Perkin Elmer Genomics will mail the parents a saliva collection kit with instructions for specimen collection and free return shipping.

Turn-around-time for genetic testing is approximately 4 weeks

Repeat CKMM: Concurrently, Early Check also provides a repeat CK-MM blood test on a second blood sample. Early Check has partnered with LabCorp to perform specimen collection and laboratory testing at no charge to parents or insurance. Early Check will work with parents to identify a local LabCorp location that specializes in pediatric specimen collection to coordinate this aspect of confirmatory testing.

Turn-around-time for repeat CK testing is 5-7 business days. Parents have the option of receiving this result as soon as it is available.

Reporting Confirmatory Results to Parents and Next Steps

If either of the two confirmatory tests are positive, Early Check will provide genetic counseling, parental support, clinical research evaluation, neuro-developmental assessments, and recommendations for medical care to families.

An Early Check genetic counselor and partner pediatric neuromuscular specialist at the Duke MDA clinic will help parents understand what the results mean for their infant and family, and what treatments are available.

Early Check will report genetic mutations known to cause or likely to cause Duchenne muscular dystrophy and related muscle conditions to the parents. Genetic variants of unknown significance will be considered and reported only if there is clinical suspicion for an undiagnosed neuromuscular condition. In addition, genetic testing may identify female carriers for DMD or related neuromuscular conditions. These results will also be reported to the parent or guardian.

For More Information visit https://earlycheck.org/

Visit the Early Check website for parents of a baby with a high CKMM newborn screening test: https://portal.earlycheck.org/en/ckmm/confirmatory-testing-for-dmd