NORTH CAROLINA NEWBORN SCREENING PROGRAM

Krabbe Disease Fact Sheet for Providers

What is Krabbe disease?

Krabbe disease is an inherited lysosomal disorder caused by mutations in the galactocerebrosidase (*GALC)* gene. *GALC* is responsible for maintenance and turnover of the myelin sheath. *GALC* also breaks down psychosine, a lipid produced during the creation of myelin. In high amounts, psychosine is toxic to the body and can lead to deterioration of the myelin sheath and nerve damage and ultimately neurodegeneration of the brain. There are two main types of Krabbe disease: infantile and late-onset. The infantile type is the most severe with death by 2 years of age if left untreated. Late-onset types include late-infantile, juvenile, and adult onset. Although the late-onset types are less severe, the late-infantile form may also be treated in early childhood.

What are the signs and symptoms of Krabbe disease?

Krabbe disease is a lifelong condition and presents differently for each child. Signs of infantile-onset Krabbe disease can appear in the first few months after birth. Signs of late-onset Krabbe disease may not appear until later in infancy, childhood, adolescence, or even adulthood.

Signs of infantile-onset Krabbe disease type include:

- Feeding problems
- Irritability
- Stiffness and muscle spasms
- Muscle weakness
- Delayed motor milestones
- Seizures
- Vision loss

How is Krabbe disease diagnosed?

Newborn screening for Krabbe disease involves screening for both *GALC e*nzyme activity and psychosine concentration. A positive newborn screen does not confirm a diagnosis of Krabbe disease. Additional testing is required to confirm the diagnosis and includes the following:

- Enzyme testing: A biochemical test that measures the level of the leukocyte *GALC* enzyme in white blood cells.
- Psychosine measurement: A biochemical test that measures the concentration of psychosine in the red blood cells.
- Molecular testing: Sequencing and deletion/duplication analysis of the *GALC* gene to identify mutations.

Combined evaluation of *GALC* enzyme activity and psychosine concentration predict the phenotype (infantile, late infantile, juvenile, or adult-onset Krabbe disease).

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How is Krabbe disease treated?

Currently, the only treatment available is hematopoietic stem cell transplantation (HSCT). HSCT has been shown to slow the progression of the disease, improve quality of life, and increase the lifespan. It is most effective if performed before 30 days of life in patients with the infantile form, or prior to the onset of clinical symptoms in the late-onset forms. Gene therapy and other clinical trials are under investigation. Supportive therapies and management like physical therapy and medications can also be beneficial.

How do I handle an abnormal screening for Krabbe disease?

If you have a patient with an abnormal newborn screen for Krabbe disease, inform the family of the newborn screening results immediately. In addition:

- Provide the family with the Krabbe disease parent fact sheet.
- Immediately after seeing the baby or talking with the parents, contact Dr. Joanne Kurtzberg (Office: 919-688-1119, Cell: 919-599-3269) or Tara West (Office: 919-688-8286, Cell: 919-720-0385) at the Duke Pediatric Transplant and Cellular Therapy (PTCT) Program. Contacts on nights or weekends or holidays are fine. The PTCT team may also reach out to you directly.
- Report final diagnostic outcomes to the North Carolina Newborn Screening program.

Where do I go for more information?

Use your phone's camera to scan the QR codes below.

ACT Sheet – Infantile

ACT Sheet – Late-onset

Gene Reviews

NORD

Duke PTCT Program

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NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

State of North Carolina Department of Health and Human Services Division of Public Health
www.ncdhhs.gov
https://slph.dph.ncdhhs.gov/newborn/default.asp
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