

Newborn Screening Quality Assurance Program

PROFICIENCY TESTING

LYSOSOMAL STORAGE DISORDER Quarterly Report

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INTRODUCTION

This report is the Quarterly summary of all data reported within the specified data-reporting period for the Quarter 3, 2014, pilot proficiency testing (PT) program for Lysosomal Storage Disorders (LSD) in dried-blood spots (DBS) to detect Krabbe and/or Pompe disease. The attached tables provide the certification profiles for the distributed specimens, the verification of your reported data, and the summary of reported analytical and categorical results. We distribute this PT report to all participants, state laboratory directors, and program colleagues by request.

On July 14, 2014, a panel of five unknown DBS specimens was distributed to seven laboratories in the United States to analyze Galactocerebrosidase (GALC) for Krabbe disease and/or Acid Alpha-Glucosidase (GAA) for Pompe disease in whole blood.

PARTICIPANT RESULTS

This panel consisted of five DBS specimens prepared from human blood, including cord blood from unaffected individuals and leuko-depleted adult blood restored with lymphoblast cells derived from patients with LSD (specimens 314L1, 314L2, 314L3, 314L4, and 314L5).

We processed data from eight participants. Laboratories were asked to report quantitative results for GALC and/or GAA in $\mu\text{mol/hr/L}$ units and qualitative results as “No Follow-Up Required (Screen Negative)” or “Follow-Up Required”. In the statistical summary analysis, we did not include data that were outside the 99% confidence interval, nor did we include summary data for methods reported by less than two laboratories.

For GALC six laboratories reported using flow injection analysis MS/MS (FIA-MS/MS), non-kit; and one used LC-MS/MS. For GAA five laboratories reported using FIA-MS/MS, non-kit; one used LC-MS/MS; and one used digital microfluidic technology (Advanced Liquid Logic).

The expected GALC and GAA values were based on CDC assayed values by FIA-MS/MS. The frequency distribution of participants' interpretations for categorical results is shown in Tables 1a-b. Specimen certification information is given in Table 2 and overall statistics for GALC and GAA are given in Tables 3a-b.

The mean cutoff for the GALC methods was 0.60, with a range of 0.30 to 1.10 $\mu\text{mol/hr/L}$; the mean cutoff for the GAA methods was 3.37 with a range of 2.10 to 4.46 $\mu\text{mol/hr/L}$.

No false-positive and no false negative assessments were reported for Krabbe (GALC) or Pompe (GAA).

The Newborn Screening Quality Assurance Program will ship next Quarter's pilot PT specimens for Krabbe and/or Pompe disease on October 6, 2014. ❖

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CDC/APHL

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NEWBORN SCREENING QUALITY ASSURANCE PROGRAM
LYSOSOMAL STORAGE DISORDERS TO DETECT KRABBE AND/OR POMPE DISEASE
IN DRIED-BLOOD SPOTS
Quarter 3 – August 2014

Table 1a. Frequency of reported Clinical Assessments: KRABBE DISEASE (GALC)

| Specimen Number | No follow-up required (Screen Negative) | Follow-up required |
|------------------------|--|---------------------------|
| 314L1 | 7 | 0 |
| 314L2 | 0 | 7 |
| 314L3 | 7 | 0 |
| 314L4 | 7 | 0 |
| 314L5 | 7 | 0 |

Table 1b. Frequency of Reported Clinical Assessments: POMPE DISEASE (GAA)

| Specimen Number | No follow-up required (Screen Negative) | Follow-up required |
|------------------------|--|---------------------------|
| 314L1 | 7 | 0 |
| 314L2 | 7 | 0 |
| 314L3 | 7 | 0 |
| 314L4 | 0 | 7 |
| 314L5 | 7 | 0 |

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Table 2. Specimen Certification

| Specimen Number | Expected GALC ($\mu\text{mol/hr/L}$) | KRABBE Assessment Code |
|-----------------|---|------------------------|
| 314L1 | 5.02 | 1 |
| 314L2 | 0.29 | 2 |
| 314L3 | 7.08 | 1 |
| 314L4 | 2.34 | 1 |
| 314L5 | 3.72 | 1 |
| Specimen Number | Expected GAA ($\mu\text{mol/hr/L}$) | POMPE Assessment Code |
| 314L1 | 19.09 | 1 |
| 314L2 | 30.34 | 1 |
| 314L3 | 24.96 | 1 |
| 314L4 | 0.02 | 2 |
| 314L5 | 15.12 | 1 |

1 = No Follow-Up Required (Screen Negative)
 2 = Follow-Up Required

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OVERALL STATISTICS

Table 3a. Screening Results for GALC – Mass Spectrometry Methods‡

| Specimen | N | Outliers* | Mean (μmol/hr/L) | UL (95%) | LL (95%) |
|----------|---|-----------|------------------|----------|----------|
| 314L1 | 6 | 0 | 4.81 | 7.53 | 2.09 |
| 314L2 | 6 | 0 | 0.16 | 0.37 | 0.00 |
| 314L3 | 6 | 0 | 6.20 | 10.36 | 2.05 |
| 314L4 | 6 | 0 | 2.03 | 3.44 | 0.62 |
| 314L5 | 6 | 0 | 3.31 | 5.46 | 1.16 |

‡ Data from methods where N<2 are not included.

* Outliers are not included in N

UL = upper limit LL = lower limit

Table 3b. Screening Results for GAA – Mass Spectrometry Methods‡

| Specimen | N | Outliers* | Mean (μmol/hr/L) | UL (95%) | LL (95%) |
|----------|---|-----------|------------------|----------|----------|
| 314L1 | 5 | 0 | 19.39 | 27.01 | 11.77 |
| 314L2 | 5 | 0 | 31.60 | 41.65 | 21.56 |
| 314L3 | 5 | 0 | 21.53 | 29.52 | 13.54 |
| 314L4 | 5 | 0 | 0.49 | 1.49 | 0.00 |
| 314L5 | 5 | 0 | 15.32 | 22.94 | 7.71 |

‡ Data from methods where N<2 are not included.

* Outliers are not included in N

UL = upper limit LL = lower limit

This **NEWBORN SCREENING QUALITY ASSURANCE PROGRAM** report is an internal publication distributed to program participants and selected program colleagues. The laboratory quality assurance program is a project cosponsored by the **Centers for Disease Control and Prevention (CDC)** and the **Association of Public Health Laboratories**.

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