

# Newborn Screening Quality Assurance Program

PROFICIENCY TESTING

Lysosomal Storage Disorder  
Quarterly Report

Volume 4, No. 2

May 2015

## INTRODUCTION

This report is the Quarterly summary of all data reported within the specified data-reporting period for the Quarter 2, 2015, 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 April 6, 2015, a panel of five unknown DBS specimens was distributed to nine 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 215L1, 215L2, 215L3, 215L4, and 215L5).

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 five laboratories reported using flow injection analysis MS/MS (FIA-MS/MS), non-kit; one used LC- MS/MS; and one used digital microfluidic technology. For GAA five laboratories reported using FIA-MS/ MS, non-kit; one used LC-MS/MS; one used a fluorometric method; and one used digital microfluidic technology.

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 0.47, with a range of 0.17 to 0.90  $\mu\text{mol/hr/L}$ ; the mean cutoff for the GAA methods was 3.77 with a range of 1.35 to 7.20  $\mu\text{mol/hr/L}$ .

No false negative assessments were reported for Krabbe (GALC) or Pompe (GAA), while one false positive assessment was reported for Specimen 215L5 for Pompe (GAA). False-positive assessments should be monitored and kept as low as possible.

The Newborn Screening Quality Assurance Program will ship next Quarter’s pilot PT specimens for Krabbe and/or Pompe disease on July 13, 2015.

## ACKNOWLEDGMENTS

We would like to thank Barbara Waters-Pick (Duke University Medical Center) for the supply of umbilical cord blood units.

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 2 – May 2015

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

<b>Specimen Number</b>	<b>No follow-up required (Screen Negative)</b>	<b>Follow-up required</b>
215L1	7	0
215L2	0	7
215L3	7	0
215L4	7	0
215L5	7	0

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

<b>Specimen Number</b>	<b>No follow-up required (Screen Negative)</b>	<b>Follow-up required</b>
215L1	8	0
215L2	8	0
215L3	8	0
215L4	0	8
215L5	7	1

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Table 2. Specimen Certification

Specimen Number	Expected GALC ( $\mu\text{mol/hr/L}$ )	KRABBE Assessment Code
215L1	10.03	1
215L2	0.31	2
215L3	4.40	1
215L4	3.04	1
215L5	2.88	1
Specimen Number	Expected GAA ( $\mu\text{mol/hr/L}$ )	POMPE Assessment Code
215L1	43.85	1
215L2	30.50	1
215L3	17.86	1
215L4	0.01	2
215L5	5.45	1

1 = No Follow-Up Required (Screen Negative)

2 = Follow-Up Required

OVERALL  
STATISTICS

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

Specimen	N	Outliers*	Mean (µmol/hr/L)	UL (95%)	LL (95%)
215L1	6	0	9.06	15.23	2.89
215L2	6	0	0.23	0.33	0.13
215L3	6	0	4.19	6.42	1.95
215L4	6	0	2.85	5.17	0.53
215L5	6	0	2.70	4.18	1.22

‡ 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%)
215L1	6	1	35.67	51.32	20.02
215L2	6	1	32.45	42.88	22.01
215L3	6	1	15.02	22.11	7.92
215L4	6	1	0.23	0.58	0.00
215L5	6	1	4.86	6.63	3.10

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

\* Outliers are not included in N

UL = upper limit

LL = lower limit

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