



Newborn Screening Quality Assurance Program

QUALITY CONTROL

MIDYEAR REPORT

Volume 18, No. 1

July 2007

INTRODUCTION

The Newborn Screening Quality Assurance Program (NSQAP), Centers for Disease Control and Prevention (CDC), distributed dried-blood-spot (DBS) quality control (QC) materials for thyroxine (T_4), thyroid-stimulating hormone (TSH), 17 α -hydroxyprogesterone (17-OHP), total galactose (Gal), phenylalanine (Phe), leucine (Leu), methionine (Met), tyrosine (Tyr), valine (Val), citrulline (Cit), and twelve acylcarnitines (C0, C2, C3, C4, C5, C5DC, C6, C8, C10, C14, C16, C18) to laboratories operating newborn screening programs and to manufacturers of screening test products. Included with each semiannual shipment of QC specimens were data-report forms to be completed and returned to CDC.

This midyear report contains a summary of the QC data submitted during the first half of 2007 by state, contract, and private laboratories in the United States; international participants; and manufacturers of screening test products.

---- QC DATA ----
see pages 3-26

QUALITY CONTROL MATERIALS

The QC specimen lots were provided as 6-month supplies of DBSs on filter paper. All DBS QC lots were prepared from whole blood of 55% hematocrit. The QC materials were enriched with predetermined quantities of the selected analytes and dispensed in 100 μ L aliquots on Whatman Inc. (Fairfield, NJ) Grade 903 filter paper.

A QC shipment for T_4 , TSH, or 17-OHP consisted of blood-spot materials from three lots per analyte, with each lot containing a different concentration of analyte. A QC shipment for Gal, Phe, Leu, Met, Tyr, Val, Cit, and the acylcarnitines consisted of blood-spot cards from four different lots.

The QC materials were supplied for use as external controls in quantities sufficient to maintain continuity and transcend changes in production lots of routinely used method- or kit-control materials. The external QC materials were intended to supplement the participants' method- or kit-control materials at periodic intervals and to allow participants to monitor the long-term stability of their assays. The QC materials should not be used as routine daily QCs.

PARTICIPANTS' RESULTS

For this midyear report, we compiled the data that each participant reported from five analytic runs of specimens from each QC lot and calculated mean values and standard deviations from these data. Data values outside the 99% confidence interval for each QC lot were not included in the computations. We could not include qualitative data, data submitted as inequalities or ranges, data submitted in unidentified units, or data from more than five analytic runs per specimen lot per participant. Some participants submitted results in units other than those requested on the data-report forms. To ensure that all results are appropriately entered in the CDC database, participants should convert their results to the requested units before entering them on the data-report forms.

The reported QC data are summarized in tables on pages 3-26, which show the analyte by series of QC lots, the number of measurements (N), the mean values, and the standard deviations (SD) by kit or analytic method. In addition, we used a weighted linear regression analysis to examine the comparability by method of reported (aggregated) versus enriched concentrations. Results of the linear regression analyses are summarized in the tables on pages 3-26.

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DISCUSSION

The enriched values of the QC specimen lots, shown in the tables for each lot, do not take into account the endogenous levels of the analytes; however, analytic results indicate that endogenous concentrations are negligible for all analytes except Phe, Leu, Met, Tyr, Val, Cit, and the acylcarnitines. For Phe, Leu, Met, Tyr, Val, Cit, and the acylcarnitines, the nonenriched base pools were distributed as the first QC specimen lot in each series so that participants could measure the endogenous Phe, Leu, Met, Tyr, Val, Cit, or acylcarnitine concentration of the series. QC lots 625–628 were enriched with Gal, Phe, Leu, Met, Tyr, Val, and Cit. QC lots 661–664 were enriched with acylcarnitines. All other QC lots were enriched with one analyte per lot. Gal lots 625–628 were enriched with equimolar quantities of simple galactose and galactose-1-phosphate.

The tables, which summarize reported QC results (pages 3–26), provide data for method-related differences in analytic recoveries and method bias. Because we prepared each QC lot series from a single batch of hematocrit-adjusted, nonenriched blood, the endogenous concentration was the same for all specimens in a lot series. We calculated the within-laboratory SD component of the total SD and used the reported QC data from multiple analytic runs for regression analyses. We calculated the Y-intercept and slope listed in each table using all analyte concentrations within a lot series (e.g., lots 611, 612, and 613). Because only three or four concentrations of QC materials are available for each analyte, a bias error in any one pool can markedly influence the slope and intercept. The Y-intercept provides one measure of the endogenous concentration level for an analyte. For Phe, Leu, Met, Tyr, Val, Cit, and the acylcarnitines, participants measured the endogenous concentration levels by analyzing the nonenriched QC lots. When endogenous levels were compared for the amino acids and

the acylcarnitines, we found them to be similar for all methods per analyte. Ideally, the slope should be 1.0, and most slopes were close to this value, ranging from 0.8 to 1.2 but some were a bit farther away. For example, for one Gal method, the slope was 1.6; for one TSH method, the slope was 1.4; for one C14 method, the slope was 0.70; and for one C18 method, the slope was 0.64. The C5DC methods show the greatest variation in slopes among all analytes. For C5DC, note that for both kit and non-kit users, the calculation of concentrations for the QC lots may vary with type of internal standard. Data are not sorted by internal standard type. Slope deviations may be related to analytic ranges for calibration curves. Because the endogenous concentration was the same for all QC lots within a series, it should not affect the slope of the regression line among methods. Generally, slope values substantially different from 1.0 indicate that a method has an analytic bias.

Each year, with the extensive cooperation of Whatman Inc., we routinely monitor the absorption characteristics of approved filter paper. (Participants may refer to page 7 of the 2006 Newborn Screening Quality Assurance Program summary report* for charts of the serum absorbancies of 22 Grade 903 filter paper lots that CDC monitored.) The following Whatman Grade 903 filter paper lots were used in the production of QC specimen lots distributed during the first 6 months of 2007: W041 (Lots 501–503, 551–553, 611–613, 661–664, 691–694) and W051 (Lots 625–628).

* Bell CJ, editor. Newborn Screening Quality Assurance Program: 2006 Annual Summary Report. Atlanta: Centers for Disease Control and Prevention, 2007;24:1–71.

<http://www.cdc.gov/labstandards/nsqap.htm>

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services or the association of Public Health Laboratories.

2007 Quality Control Data
Summaries of Statistical Analyses

IMMUNOREACTIVE TRYPSINOGEN (ng IRT/mL blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 691 - Assayed 25.7 ng/mL blood						
Delfia	108	21.7	2.1	2.8	0.6	0.9
AutoDelfia	348	23.6	2.4	2.9	-0.7	1.1
Bio-Rad Quantase	30	15.9	1.9	4.4	-3.3	0.8
Bioclone ELISA	10	21.3	2.2	2.2	-17.4	1.2
Other	10	24.9	4.1	4.1	26.1	0.6
Lot 692 - Assayed 61.7 ng/mL blood						
Delfia	109	59.9	4.3	5.1	0.6	0.9
AutoDelfia	344	65.5	5.1	5.9	-0.7	1.1
Bio-Rad Quantase	30	50.3	5.0	8.0	-3.3	0.8
Bioclone ELISA	10	45.6	6.9	6.9	-17.4	1.2
Other	10	73.1	5.5	5.5	26.1	0.6
Lot 693 - Assayed 109.8 ng/mL blood						
Delfia	108	109.7	9.9	10.7	0.6	0.9
AutoDelfia	345	120.6	9.8	11.6	-0.7	1.1
Bio-Rad Quantase	30	89.3	6.7	9.7	-3.3	0.8
Bioclone ELISA	10	105.3	17.5	17.5	-17.4	1.2
Other	10	109.3	6.6	6.6	26.1	0.6
Lot 694 - Assayed 198 ng/mL blood						
Delfia	107	185.5	17.2	22.3	0.6	0.9
AutoDelfia	343	206.9	16.1	21.7	-0.7	1.1
Bio-Rad Quantase	30	160.6	13.3	22.8	-3.3	0.8
Bioclone ELISA	10	215.8	37.3	37.3	-17.4	1.2
Other	10	134.7	5.8	5.8	26.1	0.6

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

THYROXINE ($\mu\text{g T}_4/\text{dL serum}$)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 501 - Enriched 2 $\mu\text{g}/\text{dL}$ serum						
MP Biomedicals RIA	20	2.6	0.7	0.7	1.6	0.7
Neo-Genesis Accuwell	50	2.7	0.4	0.7	0.5	1.0
Delfia	116	2.5	0.3	0.6	0.8	0.9
AutoDelfia	329	2.5	0.4	0.4	0.9	0.8
In House	10	2.9	0.2	0.2	1.5	0.7
Other	38	2.6	0.3	0.6	0.9	0.9
Lot 502 - Enriched 7 $\mu\text{g}/\text{dL}$ serum						
MP Biomedicals RIA	16	6.9	0.5	0.6	1.6	0.7
Neo-Genesis Accuwell	48	6.9	0.9	1.6	0.5	1.0
Delfia	114	7.0	0.6	1.3	0.8	0.9
AutoDelfia	330	6.7	0.6	0.8	0.9	0.8
In House	10	6.9	0.5	0.5	1.5	0.7
Other	40	7.3	0.7	1.7	0.9	0.9
Lot 503 - Enriched 11 $\mu\text{g}/\text{dL}$ serum						
MP Biomedicals RIA	24	8.6	1.8	2.5	1.6	0.7
Neo-Genesis Accuwell	49	11.5	1.4	4.5	0.5	1.0
Delfia	114	10.4	1.1	2.4	0.8	0.9
AutoDelfia	330	9.8	0.9	1.4	0.9	0.8
In House	10	9.6	0.8	0.8	1.5	0.7
Other	40	10.6	1.3	2.4	0.9	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

THYROID-STIMULATING HORMONE (μ IU TSH/mL serum)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 611 - Enriched 25 μ IU/mL serum						
Siemens Medical (DPC)	20	35.9	2.1	2.6	2.7	1.3
Neo-Genesis Accuwell	30	27.2	2.9	4.8	2.7	1.0
MP Biomedicals IRMA	20	34.7	3.4	10.1	6.9	1.2
MP Biomedicals ELISA	10	24.7	4.2	4.2	6.9	0.8
Delfia	462	30.3	2.9	5.2	3.5	1.1
AutoDelfia	767	31.3	2.5	3.2	4.4	1.1
Ani Labsystems	60	35.0	4.1	7.8	4.9	1.3
Bio-Rad Quantase	110	32.9	3.6	6.6	7.1	1.0
TecnoSuma UMELISA	39	30.9	3.9	3.9	1.2	1.2
Bioclone ELISA	49	40.7	4.5	13.7	6.0	1.4
DiaSorin	48	40.9	4.3	4.3	9.0	1.3
ECLIA	10	26.7	1.0	1.0	6.4	0.9
In House	68	29.3	3.8	5.3	4.6	1.0
Other	239	33.9	3.0	7.7	5.2	1.2
Lot 612 - Enriched 40 μ IU/mL serum						
Siemens Medical (DPC)	20	57.4	3.1	3.8	2.7	1.3
Neo-Genesis Accuwell	30	42.2	4.8	6.5	2.7	1.0
MP Biomedical IRMA	20	59.0	3.5	6.1	6.9	1.2
MP Biomedicals ELISA	10	40.8	3.9	3.9	6.9	0.8
Delfia	465	49.5	4.9	7.9	3.5	1.1
AutoDelfia	762	49.5	3.7	4.7	4.4	1.1
Ani Labsystems	60	56.4	7.4	12.1	4.9	1.3
Bio-Rad Quantase	110	48.5	4.0	9.0	7.1	1.0
TecnoSuma UMELISA	39	47.8	5.9	6.0	1.2	1.2
Bioclone ELISA	50	64.0	5.6	18.0	6.0	1.4
DiaSorin	48	60.8	6.7	6.7	9.0	1.3
ECLIA	10	44.9	2.2	2.2	6.4	0.9
In House	70	45.8	5.0	5.8	4.6	1.0
Other	239	53.5	4.3	10.9	5.2	1.2
Lot 613 - Enriched 80 μ IU/mL serum						
Siemens Medical (DPC)	20	110.5	7.9	11.5	2.7	1.3
Neo-Genesis Accuwell	30	81.3	7.5	11.4	2.7	1.0
MP Biomedicals RMA	20	103.0	6.5	7.1	6.9	1.2
MP Biomedicals ELISA	10	69.2	5.0	5.0	6.9	0.8
Delfia	459	92.2	8.4	11.7	3.5	1.1
AutoDelfia	766	92.5	6.9	8.8	4.4	1.1
Ani Labsystems	58	104.5	9.0	16.8	4.9	1.3
Bio-Rad Quantase	105	89.8	5.3	16.8	7.1	1.0
TecnoSuma UMELISA	38	95.5	13.0	16.1	1.2	1.2
Bioclone ELISA	50	119.5	12.3	34.6	6.0	1.4
DiaSorin	48	111.8	13.2	14.7	9.0	1.3
ECLIA	10	76.9	4.0	4.0	6.4	0.9
In House	70	85.3	10.4	16.0	4.6	1.0
Other	240	99.4	8.4	19.4	5.2	1.2

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

17 α -HYDROXYPROGESTERONE (ng 17-OHP/mL serum)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 551 - Enriched 25 ng/mL serum						
MP Biomedicals RIA	20	23.5	1.4	1.9	-3.9	1.1
Neo-Genesis Accuwell	19	26.1	3.9	4.4	2.2	1.0
Delfia	122	25.7	3.3	5.5	-6.8	1.2
AutoDelfia	474	27.7	3.0	3.8	-3.7	1.2
Bio-Rad Quantase	40	26.5	2.8	8.8	-5.3	1.2
Bayer Medical	20	25.9	3.9	5.4	-1.9	1.1
LC-MS/MS	20	30.3	5.3	9.9	-8.8	1.6
In House	20	22.7	2.9	2.9	-4.3	1.1
Other	40	42.8	5.9	29.4	-0.1	1.6
Lot 552 - Enriched 50 ng/mL serum						
MP Biomedicals RIA	19	48.6	4.3	4.3	-3.9	1.1
Neo-Genesis Accuwell	20	51.7	11.1	11.1	2.2	1.0
Delfia	125	53.2	5.3	6.8	-6.8	1.2
AutoDelfia	468	54.7	5.0	6.1	-3.7	1.2
Bio-Rad Quantase	40	52.3	6.9	12.9	-5.3	1.2
Bayer Medical	20	51.9	4.9	6.3	-1.9	1.1
LC-MS/MS	20	68.5	6.6	30.6	-8.8	1.6
In House	20	51.0	8.4	8.4	-4.3	1.1
Other	40	78.8	8.5	46.0	-0.1	1.6
Lot 553 - Enriched 100 ng/mL serum						
MP Biomedicals RIA	20	103.4	13.8	23.9	-3.9	1.1
Neo-Genesis Accuwell	19	99.4	22.1	22.1	2.2	1.0
Delfia	127	118.3	13.6	19.8	-6.8	1.2
AutoDelfia	470	117.5	10.3	12.1	-3.7	1.2
Bio-Rad Quantase	40	116.0	14.4	28.3	-5.3	1.2
Bayer Medical	20	107.5	9.2	9.2	-1.9	1.1
LC-MS/MS	20	146.6	33.4	47.7	-8.8	1.6
In House	20	105.0	18.6	18.8	-4.3	1.1
Other	40	164.5	16.7	108.1	-0.1	1.6

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

TOTAL GALACTOSE (mg Gal/dL whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 625 - Enriched 5 mg/dL whole blood						
Fluorometric Manual	98	5.5	0.8	1.0	0.8	1.0
Fluorometric Cont-Flow, Kit	10	3.1	0.7	0.7	0.3	0.7
Colorimetric	39	6.3	1.0	2.1	0.1	1.3
PerkinElmer Neonatal Kit	40	5.0	0.5	0.6	1.4	0.8
Neo-Genesis Accuwell	29	5.4	0.4	0.4	0.7	1.0
Bio-Rad Quantase	178	5.5	0.8	1.4	-0.9	1.3
MP Biomedicals Enzyme Assay	40	9.7	1.3	2.1	2.9	1.6
Interscientific Enzyme	20	4.3	0.4	0.8	-0.8	1.0
Astoria-Pacific	110	7.8	1.2	1.7	2.2	1.1
Other	87	5.8	1.4	2.3	1.3	1.0
Lot 626 - Enriched 10 mg/dL whole blood						
Fluorometric Manual	99	10.7	1.2	1.4	0.8	1.0
Fluorometric Cont-Flow, Kit	10	7.3	1.9	1.9	0.3	0.7
Colorimetric	40	12.7	1.9	4.0	0.1	1.3
PerkinElmer Neonatal Kit	40	9.7	0.8	0.9	1.4	0.8
Neo-Genesis Accuwell	30	10.7	1.3	1.3	0.7	1.0
Bio-Rad Quantase	179	11.8	1.5	3.0	-0.9	1.3
MP Biomedicals Enzyme Assay	40	18.9	1.8	3.2	2.9	1.6
Interscientific Enzyme	18	9.1	0.6	1.0	-0.8	1.0
Astoria-Pacific	107	13.3	1.6	2.5	2.2	1.1
Other	89	11.3	1.5	2.8	1.3	1.0
Lot 627 - Enriched 15 mg/dL whole blood						
Fluorometric Manual	95	15.8	1.1	1.5	0.8	1.0
Fluorometric Cont-Flow, Kit	10	10.1	2.1	2.1	0.3	0.7
Colorimetric	40	19.0	2.3	4.0	0.1	1.3
PerkinElmer Neonatal Kit	40	13.9	1.2	1.3	1.4	0.8
Neo-Genesis Accuwell	30	16.4	1.6	1.6	0.7	1.0
Bio-Rad Quantase	177	19.6	2.3	3.8	-0.9	1.3
MP Biomedicals Enzyme Assay	40	28.1	2.6	4.9	2.9	1.6
Interscientific Enzyme	21	14.4	1.5	1.5	-0.8	1.0
Astoria-Pacific	108	19.3	1.9	2.7	2.2	1.1
Other	89	16.4	2.4	4.3	1.3	1.0
Lot 628 - Enriched 30 mg/dL whole blood						
Fluorometric Manual	100	30.4	2.6	4.2	0.8	1.0
Fluorometric Cont-Flow, Kit	10	19.7	5.7	5.7	0.3	0.7
Colorimetric	40	37.8	3.5	7.0	0.1	1.3
PerkinElmer Neonatal Kit	40	25.5	2.0	2.1	1.4	0.8
Neo-Genesis Accuwell	30	30.7	2.5	2.6	0.7	1.0
Bio-Rad Quantase	180	38.2	4.2	8.0	-0.9	1.3
MP Biomedicals Enzyme Assay	30	49.4	3.8	8.2	2.9	1.6
Interscientific Enzyme	20	29.3	2.7	2.7	-0.8	1.0
Astoria-Pacific	108	35.9	3.4	5.3	2.2	1.1
Other	89	30.5	3.1	7.4	1.3	1.0

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

PHENYLALANINE (mg Phe/dL whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 625 - Nonenriched 0 mg/dL whole blood						
Bacterial Inhibition Assays	30	1.8	0.3	0.9	1.5	1.1
Fluorometric Manual	29	2.1	0.3	1.0	2.1	1.0
Fluorometric Cont Flow, In house	19	2.2	0.2	0.4	2.2	1.1
Fluorometric Cont Flow, Kit	80	1.9	0.2	0.3	2.0	1.1
Colorimetric	50	1.8	0.2	0.3	1.9	1.4
PerkinElmer Neonatal Kit	231	1.5	0.2	0.2	1.5	1.0
Neo-Genesis Accuwell	20	1.8	0.3	0.3	1.8	1.1
Ani Labsystems	87	2.0	0.2	0.5	2.1	1.1
Bio-Rad Quantase	87	1.6	0.3	0.4	1.5	1.1
MP Biomedicals Enzyme Assay	10	1.4	0.3	0.3	1.1	1.3
Interscientific Enzyme	39	1.6	0.2	0.2	1.6	1.0
Astoria-Pacific	10	2.7	0.2	0.2	2.8	1.4
HPLC	20	1.7	0.1	0.2	1.6	1.1
Derivatized-MS/MS Non-Kit	672	1.5	0.1	0.2	1.5	1.0
Non-derivatized MS/MS Non-Kit	108	1.7	0.2	0.3	1.7	1.1
Derivatized-MS/MS PE NeoGram	250	1.6	0.2	0.2	1.6	0.9
Non-derivatized MS/MS PE NeoGram	40	1.6	0.1	0.1	1.5	1.1
TecnoSuma UMTEST	29	1.7	0.3	0.6	1.5	1.2
Other	50	1.5	0.2	0.5	1.6	1.2
Lot 626 - Enriched 3 mg/dL whole blood						
Bacterial Inhibition Assays	40	4.7	0.7	0.9	1.5	1.1
Fluorometric Manual	30	5.0	0.4	0.7	2.1	1.0
Fluorometric Cont Flow, In house	20	5.5	0.4	0.7	2.2	1.1
Fluorometric Cont Flow, Kit	80	5.3	0.5	0.7	2.0	1.1
Colorimetric	50	5.9	0.4	1.0	1.9	1.4
PerkinElmer Neonatal Kit	230	4.4	0.4	0.6	1.5	1.0
Neo-Genesis Accuwell	20	5.1	0.5	0.5	1.8	1.1
Ani Labsystems	89	5.6	0.5	1.3	2.1	1.1
Bio-Rad Quantase	89	4.7	0.5	0.7	1.5	1.1
MP Biomedicals Enzyme Assay	20	4.8	0.7	1.0	1.1	1.3
Interscientific Enzyme	39	4.4	0.5	0.5	1.6	1.0
Astoria-Pacific	10	7.1	0.4	0.4	2.8	1.4
HPLC	20	4.7	0.2	0.3	1.6	1.1
Derivatized-MS/MS Non-Kit	661	4.4	0.3	0.6	1.5	1.0
Non-derivatized MS/MS Non-Kit	109	4.9	0.4	0.8	1.7	1.1
Derivatized-MS/MS Pe NeoGram	246	4.5	0.4	0.5	1.6	0.9
Non-derivatized MS/MS PE NeoGram	40	4.8	0.4	0.6	1.5	1.1
TecnoSuma UMTEST	30	4.7	0.7	0.8	1.5	1.2
Other	50	5.1	0.6	1.4	1.6	1.2

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

PHENYLALANINE (mg Phe/dL whole blood)
- continued -

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 627 - Enriched 7 mg/dL whole blood						
Bacterial Inhibition Assays	40	8.6	1.4	1.6	1.5	1.1
Fluorometric Manual	30	8.5	0.5	0.7	2.1	1.0
Fluorometric Cont Flow, In house	20	9.7	1.1	3.2	2.2	1.1
Fluorometric Cont Flow, Kit	80	9.5	0.7	1.0	2.0	1.1
Colorimetric	50	11.8	0.5	1.7	1.9	1.4
PerkinElmer Neonatal Kit	239	8.5	0.9	1.3	1.5	1.0
Neo-Genesis Accuwell	20	9.7	0.7	0.7	1.8	1.1
Ani Labsystems	88	10.2	0.8	1.9	2.1	1.1
Bio-Rad Quantase	89	9.3	0.8	0.9	1.5	1.1
MP Biomedicals Enzyme Assay	19	10.1	0.9	0.9	1.1	1.3
Interscientific Enzyme	39	8.4	0.8	0.9	1.6	1.0
Astoria-Pacific	10	12.7	1.0	1.0	2.8	1.4
HPLC	20	9.0	0.7	0.8	1.6	1.1
Derivatized-MS/MS Non-Kit	670	8.2	0.6	1.2	1.5	1.0
Non-derivatized MS/MS Non-Kit	110	9.3	0.8	1.5	1.7	1.1
Derivatized-MS/MS PE NeoGram	244	8.4	0.8	1.1	1.6	0.9
Non-derivatized MS/MS PE NeoGram	40	8.9	0.8	1.1	1.5	1.1
TecnoSuma UMTEST	29	9.6	1.4	1.7	1.5	1.2
Other	50	10.1	0.8	2.1	1.6	1.2
Lot 628 - Enriched 11 mg/dL whole blood						
Bacterial Inhibition Assays	39	13.6	1.5	2.4	1.5	1.1
Fluorometric Manual	30	12.7	1.0	1.1	2.1	1.0
Fluorometric Cont Flow, In house	20	14.4	0.8	5.8	2.2	1.1
Fluorometric Cont Flow, Kit	79	13.5	0.7	1.1	2.0	1.1
Colorimetric	49	16.7	1.0	2.7	1.9	1.4
PerkinElmer Neonatal Kit	234	12.5	1.1	1.8	1.5	1.0
Neo-Genesis Accuwell	20	14.0	0.8	0.9	1.8	1.1
Ani Labsystems	89	14.3	1.2	2.5	2.1	1.1
Bio-Rad Quantase	88	13.8	1.0	1.7	1.5	1.1
MP Biomedicals Enzyme Assay	20	15.3	1.3	1.3	1.1	1.3
Interscientific Enzyme	40	12.2	1.2	1.3	1.6	1.0
Astoria-Pacific	10	18.0	0.7	0.7	2.8	1.4
HPLC	20	13.3	0.7	1.3	1.6	1.1
Derivatized-MS/MS Non-Kit	676	12.1	1.0	1.7	1.5	1.0
Non-derivatized MS/MS Non-Kit	108	13.7	1.1	2.3	1.7	1.1
Derivatized-MS/MS PE NeoGram	243	11.8	1.0	1.6	1.6	0.9
Non-derivatized MS/MS PE NeoGram	40	13.5	1.0	1.6	1.5	1.1
TecnoSuma UMTEST	29	14.7	2.3	2.8	1.5	1.2
Other	50	14.3	1.2	3.0	1.6	1.2

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

LEUCINE (mg Leu/dL whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 625 - Nonenriched 0 mg/dL whole blood						
Bacterial Inhibition Assays	10	2.1	0.8	0.8	1.4	1.4
Fluorometric Manual	10	2.3	0.3	0.3	2.4	0.9
Bio-Rad Quantase	10	3.7	0.2	0.2	3.6	1.6
Interscientific Enzyme	10	2.8	0.3	0.3	2.4	1.3
HPLC	20	2.1	0.2	0.2	1.7	1.4
Derivatized - MS/MS Non-Kit	635	2.7	0.2	0.5	2.3	1.3
Non-derivatized MS/MS Non-Kit	40	3.1	0.3	0.5	2.9	1.2
Derivatized - MS/MS PE NeoGram	264	2.6	0.2	0.3	2.4	1.3
Non-derivatized MS/MS PE NeoGram	40	2.6	0.3	0.3	2.4	1.2
Lot 626 - Enriched 3 mg/dL whole blood						
Bacterial Inhibition Assays	10	5.6	1.3	1.3	1.4	1.4
Fluorometric Manual	10	5.3	0.8	0.8	2.4	0.9
Bio-Rad Quantase	10	8.3	0.7	0.7	3.6	1.6
Interscientific Enzyme	10	6.2	0.5	0.5	2.4	1.3
HPLC	19	6.0	0.2	0.5	1.7	1.4
Derivatized - MS/MS Non-Kit	629	6.2	0.6	1.0	2.3	1.3
Non-derivatized MS/MS Non-Kit	40	6.3	0.5	0.8	2.9	1.2
Derivatized - MS/MS PE NeoGram	261	6.3	0.5	0.7	2.4	1.3
Non-derivatized MS/MS PE NeoGram	39	5.9	0.3	0.4	2.4	1.2
Lot 627 - Enriched 7 mg/dL whole blood						
Bacterial Inhibition Assays	10	8.8	1.8	1.8	1.4	1.4
Fluorometric Manual	10	9.0	1.2	1.2	2.4	0.9
Bio-Rad Quantase	10	14.5	1.1	1.1	3.6	1.6
Interscientific Enzyme	10	10.8	0.7	0.7	2.4	1.3
HPLC	20	10.7	0.7	0.8	1.7	1.4
Derivatized - MS/MS Non-Kit	624	11.1	0.9	1.9	2.3	1.3
Non-derivatized MS/MS Non-Kit	40	10.8	0.9	1.7	2.9	1.2
Derivatized - MS/MS PE NeoGram	262	11.3	1.0	1.4	2.4	1.3
Non-derivatized MS/MS PE NeoGram	39	10.3	0.9	1.1	2.4	1.2
Lot 628 - Enriched 11 mg/dL whole blood						
Bacterial Inhibition Assays	10	17.8	0.9	0.9	1.4	1.4
Fluorometric Manual	10	12.8	1.7	1.7	2.4	0.9
Bio-Rad Quantase	10	21.1	1.6	1.6	3.6	1.6
Interscientific Enzyme	10	17.2	1.5	1.5	2.4	1.3
HPLC	20	17.9	0.6	1.5	1.7	1.4
Derivatized - MS/MS Non-Kit	627	17.6	1.6	3.2	2.3	1.3
Non-derivatized MS/MS Non-Kit	40	16.0	1.6	3.4	2.9	1.2
Derivatized - MS/MS PE NeoGram	264	17.3	1.6	2.4	2.4	1.3
Non-derivatized MS/MS PE NeoGram	40	16.0	1.5	1.9	2.4	1.2

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

METHIONINE (mg Met/dL whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 625 - Nonenriched 0 mg/dL whole blood						
HPLC	20	0.4	0.0	0.0	0.3	1.1
Derivatized - MS/MS Non-Kit	613	0.4	0.1	0.1	0.4	1.0
Non-derivatized MS/MS Non-Kit	37	0.4	0.1	0.1	0.3	0.9
Derivatized - MS/MS PE NeoGram	257	0.5	0.1	0.1	0.4	1.1
Non-derivatized MS/MS PE NeoGram	38	0.4	0.1	0.1	0.3	0.9
Lot 626 - Enriched 1 mg/dL whole blood						
HPLC	20	1.3	0.1	0.1	0.3	1.1
Derivatized - MS/MS Non-Kit	617	1.3	0.1	0.3	0.4	1.0
Non-derivatized MS/MS Non-Kit	40	1.1	0.2	0.2	0.3	0.9
Derivatized - MS/MS PE NeoGram	244	1.4	0.1	0.2	0.4	1.1
Non-derivatized MS/MS PE NeoGram	39	1.1	0.1	0.1	0.3	0.9
Lot 627 - Enriched 3 mg/dL whole blood						
HPLC	20	3.3	0.3	0.4	0.3	1.1
Derivatized - MS/MS Non-Kit	611	3.3	0.3	0.6	0.4	1.0
Non-derivatized MS/MS Non-Kit	39	3.0	0.4	0.6	0.3	0.9
Derivatized - MS/MS PE NeoGram	255	3.7	0.4	0.5	0.4	1.1
Non-derivatized MS/MS PE NeoGram	38	3.0	0.2	0.2	0.3	0.9
Lot 628 - Enriched 6 mg/dL whole blood						
HPLC	20	6.8	0.5	0.9	0.3	1.1
Derivatized - MS/MS Non-Kit	616	6.6	0.6	1.2	0.4	1.0
Non-derivatized MS/MS Non-Kit	40	5.9	0.8	1.1	0.3	0.9
Derivatized - MS/MS PE NeoGram	254	7.0	0.7	0.9	0.4	1.1
Non-derivatized MS/MS PE NeoGram	39	5.9	0.6	0.7	0.3	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

TYROSINE (mg Tyr/dL whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 625 - Nonenriched 0 mg/dL whole blood						
Fluorometric Manual	10	2.5	0.3	0.3	2.2	1.1
HPLC	30	1.2	0.1	0.1	1.2	0.9
Derivatized - MS/MS Non-Kit	656	1.2	0.1	0.2	1.2	0.9
Non-derivatized MS/MS Non-Kit	77	1.4	0.2	0.3	1.3	1.0
Derivatized - MS/MS PE NeoGram	258	1.3	0.1	0.2	1.3	0.9
Non-derivatized MS/MS PE NeoGram	39	1.1	0.1	0.2	1.1	0.8
Lot 626 - Enriched 3 mg/dL whole blood						
Fluorometric Manual	10	5.2	0.6	0.6	2.2	1.1
HPLC	30	4.0	0.3	0.5	1.2	0.9
Derivatized - MS/MS Non-Kit	657	3.9	0.3	0.7	1.2	0.9
Non-derivatized MS/MS Non-Kit	77	4.1	0.5	0.9	1.3	1.0
Derivatized - MS/MS PE NeoGram	257	3.9	0.4	0.5	1.3	0.9
Non-derivatized MS/MS PE NeoGram	39	3.5	0.3	0.5	1.1	0.8
Lot 627 - Enriched 7 mg/dL whole blood						
Fluorometric Manual	10	9.5	0.7	0.7	2.2	1.1
HPLC	30	7.8	0.6	1.0	1.2	0.9
Derivatized - MS/MS Non-Kit	655	7.6	0.7	1.3	1.2	0.9
Non-derivatized MS/MS Non-Kit	78	8.2	0.9	1.7	1.3	1.0
Derivatized - MS/MS PE NeoGram	255	7.8	0.7	0.9	1.3	0.9
Non-derivatized MS/MS PE NeoGram	39	6.9	0.8	1.0	1.1	0.8
Lot 628 - Enriched 11 mg/dL whole blood						
Fluorometric Manual	10	14.2	2.1	2.1	2.2	1.1
HPLC	30	11.3	0.7	1.1	1.2	0.9
Derivatized - MS/MS Non-Kit	660	11.3	1.0	1.9	1.2	0.9
Non-derivatized MS/MS Non-Kit	78	12.1	1.3	2.5	1.3	1.0
Derivatized - MS/MS PE NeoGram	258	11.2	1.1	1.4	1.3	0.9
Non-derivatized MS/MS PE NeoGram	39	10.3	1.1	1.4	1.1	0.8

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

VALINE (mg Val/dL whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 625 - Nonenriched 0 mg/dL whole blood						
HPLC	20	2.5	0.2	0.4	2.6	1.0
Derivatized - MS/MS Non-Kit	565	2.1	0.2	0.5	2.1	0.8
Non-derivatized MS/MS Non-Kit	30	1.9	0.2	0.3	1.9	0.7
Derivatized - MS/MS PE NeoGram	241	2.2	0.2	0.4	2.3	0.9
Non-derivatized MS/MS PE NeoGram	39	2.0	0.2	0.2	2.0	0.7
Lot 626 - Enriched 3 mg/dL whole blood						
HPLC	20	5.6	0.4	0.5	2.6	1.0
Derivatized - MS/MS Non-Kit	565	4.6	0.5	1.0	2.1	0.8
Non-derivatized MS/MS Non-Kit	29	4.0	0.4	0.9	1.9	0.7
Derivatized - MS/MS PE NeoGram	241	4.9	0.5	0.9	2.3	0.9
Non-derivatized MS/MS PE NeoGram	39	4.3	0.3	0.4	2.0	0.7
Lot 627 - Enriched 7 mg/dL whole blood						
HPLC	20	9.9	0.6	1.2	2.6	1.0
Derivatized - MS/MS Non-Kit	559	8.0	0.8	1.7	2.1	0.8
Non-derivatized MS/MS Non-Kit	30	7.0	0.6	1.3	1.9	0.7
Derivatized - MS/MS PE NeoGram	239	8.6	0.9	1.5	2.3	0.9
Non-derivatized MS/MS PE NeoGram	40	7.4	0.6	1.2	2.0	0.7
Lot 628 - Enriched 11 mg/dL whole blood						
HPLC	20	13.8	0.9	1.3	2.6	1.0
Derivatized - MS/MS Non-Kit	557	11.3	1.1	2.2	2.1	0.8
Non-derivatized MS/MS Non-Kit	30	9.7	0.9	1.1	1.9	0.7
Derivatized - MS/MS PE NeoGram	243	11.9	1.3	2.0	2.3	0.9
Non-derivatized MS/MS PE NeoGram	40	10.2	0.8	1.6	2.0	0.7

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

CITRULLINE (mg Cit/dL whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 625 - Nonenriched 0 mg/dL whole blood						
Derivatized - MS/MS Non-Kit	590	0.5	0.1	0.1	0.4	0.9
Non-derivatized MS/MS Non-Kit	38	0.5	0.1	0.1	0.4	0.8
Derivatized - MS/MS PE NeoGram	251	0.6	0.1	0.1	0.6	1.1
Non-derivatized MS/MS PE NeoGram	39	0.6	0.1	0.1	0.5	1.1
Lot 626 - Enriched 1 mg/dL whole blood						
Derivatized - MS/MS Non-Kit	593	1.3	0.2	0.3	0.4	0.9
Non-derivatized MS/MS Non-Kit	39	1.2	0.2	0.3	0.4	0.8
Derivatized - MS/MS PE NeoGram	252	1.6	0.1	0.2	0.6	1.1
Non-derivatized MS/MS PE NeoGram	40	1.6	0.2	0.3	0.5	1.1
Lot 627 - Enriched 3 mg/dL whole blood						
Derivatized - MS/MS Non-Kit	587	2.9	0.3	0.7	0.4	0.9
Non-derivatized MS/MS Non-Kit	39	2.7	0.4	0.4	0.4	0.8
Derivatized - MS/MS PE NeoGram	255	3.7	0.3	0.5	0.6	1.1
Non-derivatized MS/MS PE NeoGram	40	3.7	0.4	0.7	0.5	1.1
Lot 628 - Enriched 6 mg/dL whole blood						
Derivatized - MS/MS Non-Kit	578	5.7	0.6	1.4	0.4	0.9
Non-derivatized MS/MS Non-Kit	39	5.3	0.9	1.0	0.4	0.8
Derivatized - MS/MS PE NeoGram	257	7.0	0.5	1.0	0.6	1.1
Non-derivatized MS/MS PE NeoGram	39	7.3	0.7	1.2	0.5	1.1

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

FREE CARNITINE ($\mu\text{mol C0/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	739	31.04	3.32	7.45	30.42	0.96
Non-derivatized MS/MS Non-Kit	59	30.95	3.49	5.04	30.66	1.03
Derivatized - MS/MS PE NeoGram	253	40.07	3.81	7.89	41.02	1.22
Non-derivatized MS/MS PE NeoGram	50	26.93	2.16	3.98	26.68	0.85
Lot 662 - Enriched 100 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	723	126.7	12.52	25.38	30.42	0.96
Non-derivatized MS/MS Non-Kit	59	133.8	13.74	18.00	30.66	1.03
Derivatized - MS/MS PE NeoGram	251	162.6	13.05	20.60	41.02	1.22
Non-derivatized MS/MS PE NeoGram	50	112.4	9.34	19.43	26.68	0.85
Lot 663 - Enriched 200 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	722	221.4	22.34	45.56	30.42	0.96
Non-derivatized MS/MS Non-Kit	59	233.9	26.79	34.32	30.66	1.03
Derivatized - MS/MS PE NeoGram	259	288.4	24.58	53.58	41.02	1.22
Non-derivatized MS/MS PE NeoGram	50	192.6	28.25	33.86	26.68	0.85
Lot 664 - Enriched 300 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	739	320.6	31.41	71.45	30.42	0.96
Non-derivatized MS/MS Non-Kit	57	339.6	35.22	42.41	30.66	1.03
Derivatized - MS/MS PE NeoGram	251	404.6	34.35	62.72	41.02	1.22
Non-derivatized MS/MS PE NeoGram	50	281.9	26.18	44.99	26.68	0.85

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

ACETYLCARNITINE ($\mu\text{mol C2/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	717	17.70	1.90	5.42	18.12	1.23
Non-derivatized MS/MS Non-Kit	49	13.66	1.39	1.42	13.59	1.28
Derivatized - MS/MS PE NeoGram	248	19.61	1.95	3.99	20.51	0.77
Non-derivatized MS/MS PE NeoGram	40	14.67	1.56	2.12	15.25	1.38
Lot 662 - Enriched 25 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	715	49.42	5.43	13.22	18.12	1.23
Non-derivatized MS/MS Non-Kit	49	45.29	3.91	4.52	13.59	1.28
Derivatized - MS/MS PE NeoGram	246	41.09	3.04	4.85	20.51	0.77
Non-derivatized MS/MS PE NeoGram	40	50.75	5.45	8.91	15.25	1.38
Lot 663 - Enriched 50 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	726	79.33	8.67	21.76	18.12	1.23
Non-derivatized MS/MS Non-Kit	50	77.96	7.88	9.15	13.59	1.28
Derivatized - MS/MS PE NeoGram	249	58.76	5.27	9.07	20.51	0.77
Non-derivatized MS/MS PE NeoGram	39	84.29	7.18	12.04	15.25	1.38
Lot 664 - Enriched 75 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	716	109.9	11.74	29.53	18.12	1.23
Non-derivatized MS/MS Non-Kit	48	109.4	10.26	12.04	13.59	1.28
Derivatized - MS/MS PE NeoGram	248	77.65	6.11	11.56	20.51	0.77
Non-derivatized MS/MS PE NeoGram	40	118.8	11.47	16.72	15.25	1.38

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

PROPIONYLCARNITINE ($\mu\text{mol C3/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	706	1.54	0.21	0.35	1.57	1.17
Non-derivatized MS/MS Non-Kit	46	1.48	0.18	0.26	1.50	1.18
Derivatized - MS/MS PE NeoGram	255	1.37	0.14	0.23	1.42	1.09
Non-derivatized MS/MS PE NeoGram	60	1.50	0.19	0.22	1.52	1.11
Lot 662 - Enriched 3 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	703	5.06	0.59	1.09	1.57	1.17
Non-derivatized MS/MS Non-Kit	48	5.08	0.64	0.98	1.50	1.18
Derivatized - MS/MS PE NeoGram	256	4.70	0.41	0.56	1.42	1.09
Non-derivatized MS/MS PE NeoGram	59	4.77	0.43	0.67	1.52	1.11
Lot 663 - Enriched 7.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	710	10.43	1.15	2.12	1.57	1.17
Non-derivatized MS/MS Non-Kit	47	10.36	1.14	1.60	1.50	1.18
Derivatized - MS/MS PE NeoGram	257	9.66	0.99	1.36	1.42	1.09
Non-derivatized MS/MS PE NeoGram	59	10.00	1.14	1.32	1.52	1.11
Lot 664 - Enriched 12 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	709	15.50	1.63	3.12	1.57	1.17
Non-derivatized MS/MS Non-Kit	47	15.70	1.66	3.06	1.50	1.18
Derivatized - MS/MS PE NeoGram	258	14.39	1.11	1.70	1.42	1.09
Non-derivatized MS/MS PE NeoGram	59	14.70	1.67	2.10	1.52	1.11

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

BUTYRYLCARNITINE ($\mu\text{mol C4/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	684	0.23	0.05	0.08	0.24	0.99
Non-derivatized MS/MS Non-Kit	46	0.20	0.06	0.08	0.21	0.98
Derivatized - MS/MS PE NeoGram	238	0.23	0.07	0.08	0.27	0.86
Non-derivatized MS/MS PE NeoGram	57	0.22	0.07	0.07	0.31	0.85
Lot 662 - Enriched 1 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	697	1.24	0.15	0.24	0.24	0.99
Non-derivatized MS/MS Non-Kit	48	1.16	0.12	0.13	0.21	0.98
Derivatized - MS/MS PE NeoGram	241	1.15	0.23	0.25	0.27	0.86
Non-derivatized MS/MS PE NeoGram	59	1.16	0.19	0.19	0.31	0.85
Lot 663 - Enriched 2.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	698	2.76	0.30	0.48	0.24	0.99
Non-derivatized MS/MS Non-Kit	49	2.72	0.34	0.37	0.21	0.98
Derivatized - MS/MS PE NeoGram	237	2.46	0.40	0.45	0.27	0.86
Non-derivatized MS/MS PE NeoGram	59	2.60	0.37	0.46	0.31	0.85
Lot 664 - Enriched 5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	695	5.20	0.55	0.86	0.24	0.99
Non-derivatized MS/MS Non-Kit	49	5.10	0.45	0.57	0.21	0.98
Derivatized - MS/MS PE NeoGram	240	4.55	0.73	0.82	0.27	0.86
Non-derivatized MS/MS PE NeoGram	58	4.47	0.69	0.89	0.31	0.85

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

ISOVALERYLCARNITINE ($\mu\text{mol C5/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	728	0.14	0.03	0.05	0.13	0.95
Non-derivatized MS/MS Non-Kit	48	0.11	0.02	0.03	0.11	0.94
Derivatized - MS/MS PE NeoGram	255	0.14	0.06	0.06	0.14	0.93
Non-derivatized MS/MS PE NeoGram	49	0.13	0.05	0.05	0.11	0.84
Lot 662 - Enriched 0.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	723	0.60	0.09	0.14	0.13	0.95
Non-derivatized MS/MS Non-Kit	49	0.56	0.07	0.09	0.11	0.94
Derivatized - MS/MS PE NeoGram	252	0.62	0.13	0.14	0.14	0.93
Non-derivatized MS/MS PE NeoGram	48	0.52	0.07	0.11	0.11	0.84
Lot 663 - Enriched 1.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	726	1.56	0.19	0.34	0.13	0.95
Non-derivatized MS/MS Non-Kit	50	1.54	0.16	0.22	0.11	0.94
Derivatized - MS/MS PE NeoGram	251	1.52	0.23	0.28	0.14	0.93
Non-derivatized MS/MS PE NeoGram	48	1.36	0.18	0.19	0.11	0.84
Lot 664 - Enriched 3 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	713	2.98	0.34	0.65	0.13	0.95
Non-derivatized MS/MS Non-Kit	49	2.91	0.31	0.47	0.11	0.94
Derivatized - MS/MS PE NeoGram	251	2.94	0.45	0.55	0.14	0.93
Non-derivatized MS/MS PE NeoGram	49	2.63	0.38	0.61	0.11	0.84

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

GLUTARYLCARNITINE ($\mu\text{mol C5DC/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Assayed 0.05 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	729	0.04	0.02	0.02	0.01	0.73
Non-derivatized MS/MS Non-Kit	50	0.04	0.01	0.03	0.00	0.69
Derivatized - MS/MS PE NeoGram	236	0.06	0.01	0.02	-0.02	1.55
Non-derivatized MS/MS PE NeoGram	50	0.16	0.05	0.11	0.09	1.54
Lot 662 - Assayed 0.18 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	728	0.14	0.04	0.06	0.01	0.73
Non-derivatized MS/MS Non-Kit	50	0.13	0.03	0.09	0.00	0.69
Derivatized - MS/MS PE NeoGram	231	0.27	0.03	0.05	-0.02	1.55
Non-derivatized MS/MS PE NeoGram	50	0.38	0.06	0.24	0.09	1.54
Lot 663 - Assayed 0.31 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	727	0.23	0.05	0.09	0.01	0.73
Non-derivatized MS/MS Non-Kit	50	0.21	0.05	0.15	0.00	0.69
Derivatized - MS/MS PE NeoGram	239	0.45	0.05	0.10	-0.02	1.55
Non-derivatized MS/MS PE NeoGram	50	0.56	0.08	0.36	0.09	1.54
Lot 664 - Assayed 0.56 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	729	0.41	0.08	0.18	0.01	0.73
Non-derivatized MS/MS Non-Kit	50	0.39	0.09	0.27	0.00	0.69
Derivatized - MS/MS PE NeoGram	230	0.86	0.08	0.15	-0.02	1.55
Non-derivatized MS/MS PE NeoGram	50	0.95	0.11	0.58	0.09	1.54

Note that for both kit and non-kit users, the calculation of concentrations for the quality control lots varied with type of internal standard. Data are not sorted by internal standard type.

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

HEXANOYLCARNITINE ($\mu\text{mol C6/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	729	0.05	0.02	0.04	0.06	0.87
Non-derivatized MS/MS Non-Kit	38	0.02	0.01	0.02	0.05	0.91
Derivatized - MS/MS PE NeoGram	247	0.06	0.04	0.04	0.08	0.88
Non-derivatized MS/MS PE NeoGram	58	0.04	0.03	0.04	0.06	0.83
Lot 662 - Enriched 0.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	731	0.49	0.07	0.13	0.06	0.87
Non-derivatized MS/MS Non-Kit	39	0.51	0.05	0.05	0.05	0.91
Derivatized - MS/MS PE NeoGram	243	0.51	0.11	0.11	0.08	0.88
Non-derivatized MS/MS PE NeoGram	59	0.48	0.07	0.10	0.06	0.83
Lot 663 - Enriched 1.0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	731	0.94	0.12	0.24	0.06	0.87
Non-derivatized MS/MS Non-Kit	40	1.00	0.11	0.11	0.05	0.91
Derivatized - MS/MS PE NeoGram	243	0.98	0.18	0.19	0.08	0.88
Non-derivatized MS/MS PE NeoGram	58	0.91	0.13	0.17	0.06	0.83
Lot 664 - Enriched 2.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	734	2.22	0.27	0.58	0.06	0.87
Non-derivatized MS/MS Non-Kit	39	2.31	0.23	0.26	0.05	0.91
Derivatized - MS/MS PE NeoGram	242	2.26	0.37	0.38	0.08	0.88
Non-derivatized MS/MS PE NeoGram	58	2.13	0.31	0.33	0.09	0.83

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

OCTANOYLCARNITINE ($\mu\text{mol C8/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	755	0.06	0.02	0.03	0.07	1.09
Non-derivatized MS/MS Non-Kit	68	0.05	0.02	0.03	0.05	1.09
Derivatized - MS/MS PE NeoGram	259	0.06	0.04	0.05	0.08	0.91
Non-derivatized MS/MS PE NeoGram	59	0.05	0.02	0.02	0.07	1.00
Lot 662 - Enriched 0.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	756	0.61	0.08	0.12	0.07	1.09
Non-derivatized MS/MS Non-Kit	68	0.59	0.06	0.06	0.05	1.09
Derivatized - MS/MS PE NeoGram	261	0.54	0.12	0.14	0.08	0.91
Non-derivatized MS/MS PE NeoGram	58	0.56	0.06	0.08	0.07	1.00
Lot 663 - Enriched 1.0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	748	1.17	0.13	0.22	0.07	1.09
Non-derivatized MS/MS Non-Kit	68	1.15	0.13	0.14	0.05	1.09
Derivatized - MS/MS PE NeoGram	259	1.00	0.18	0.20	0.08	0.91
Non-derivatized MS/MS PE NeoGram	59	1.12	0.14	0.15	0.07	1.00
Lot 664 - Enriched 2.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	752	2.78	0.32	0.50	0.07	1.09
Non-derivatized MS/MS Non-Kit	69	2.78	0.25	0.29	0.05	1.09
Derivatized - MS/MS PE NeoGram	260	2.33	0.35	0.39	0.08	0.91
Non-derivatized MS/MS PE NeoGram	58	2.55	0.22	0.29	0.07	1.00

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

DECANOYLCARNITINE ($\mu\text{mol C10/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	728	0.07	0.02	0.03	0.08	1.29
Non-derivatized MS/MS Non-Kit	40	0.06	0.02	0.03	0.07	1.20
Derivatized - MS/MS PE NeoGram	248	0.06	0.03	0.05	0.08	0.84
Non-derivatized MS/MS PE NeoGram	58	0.06	0.02	0.02	0.06	1.07
Lot 662 - Enriched 0.25 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	734	0.41	0.06	0.09	0.08	1.29
Non-derivatized MS/MS Non-Kit	40	0.37	0.04	0.07	0.07	1.20
Derivatized - MS/MS PE NeoGram	246	0.30	0.07	0.08	0.08	0.84
Non-derivatized MS/MS PE NeoGram	59	0.33	0.07	0.10	0.06	1.07
Lot 663 - Enriched 0.75 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	735	1.03	0.14	0.23	0.08	1.29
Non-derivatized MS/MS Non-Kit	40	0.97	0.12	0.19	0.07	1.20
Derivatized - MS/MS PE NeoGram	244	0.74	0.15	0.18	0.08	0.84
Non-derivatized MS/MS PE NeoGram	59	0.86	0.12	0.21	0.06	1.07
Lot 664 - Enriched 1.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	736	2.01	0.27	0.45	0.08	1.29
Non-derivatized MS/MS Non-Kit	40	1.86	0.17	0.27	0.07	1.20
Derivatized - MS/MS PE NeoGram	240	1.33	0.21	0.29	0.08	0.84
Non-derivatized MS/MS PE NeoGram	60	1.66	0.16	0.40	0.06	1.07

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

MYRISTOYLCARNITINE ($\mu\text{mol C14/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	709	0.10	0.03	0.05	0.09	0.95
Non-derivatized MS/MS Non-Kit	38	0.08	0.02	0.02	0.09	1.02
Derivatized - MS/MS PE NeoGram	243	0.10	0.04	0.05	0.11	0.90
Non-derivatized MS/MS PE NeoGram	58	0.06	0.02	0.03	0.05	0.70
Lot 662 - Enriched 0.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	694	0.58	0.09	0.13	0.09	0.95
Non-derivatized MS/MS Non-Kit	40	0.61	0.09	0.09	0.09	1.02
Derivatized - MS/MS PE NeoGram	244	0.59	0.12	0.13	0.11	0.90
Non-derivatized MS/MS PE NeoGram	59	0.42	0.05	0.14	0.05	0.70
Lot 663 - Enriched 1.5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	701	1.50	0.20	0.33	0.09	0.95
Non-derivatized MS/MS Non-Kit	40	1.61	0.17	0.17	0.09	1.02
Derivatized - MS/MS PE NeoGram	247	1.42	0.22	0.23	0.11	0.90
Non-derivatized MS/MS PE NeoGram	60	1.08	0.14	0.28	0.05	0.70
Lot 664 - Enriched 3.0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	700	2.97	0.38	0.64	0.09	0.95
Non-derivatized MS/MS Non-Kit	40	3.14	0.33	0.35	0.09	1.02
Derivatized - MS/MS PE NeoGram	246	2.83	0.42	0.46	0.11	0.90
Non-derivatized MS/MS PE NeoGram	60	2.18	0.22	0.69	0.05	0.70

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

PALMITOYLCARNITINE ($\mu\text{mol C16/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	715	0.90	0.12	0.24	0.91	0.87
Non-derivatized MS/MS Non-Kit	50	0.86	0.09	0.10	0.83	0.86
Derivatized - MS/MS PE NeoGram	259	0.88	0.16	0.22	0.95	0.83
Non-derivatized MS/MS PE NeoGram	58	0.89	0.13	0.16	0.88	0.92
Lot 662 - Enriched 4 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	708	4.37	0.51	0.92	0.91	0.87
Non-derivatized MS/MS Non-Kit	50	4.24	0.32	0.45	0.83	0.86
Derivatized - MS/MS PE NeoGram	256	4.36	0.55	0.60	0.95	0.83
Non-derivatized MS/MS PE NeoGram	60	4.53	0.48	0.75	0.88	0.92
Lot 663 - Enriched 8 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	712	7.89	0.80	1.53	0.91	0.87
Non-derivatized MS/MS Non-Kit	50	7.71	0.62	0.83	0.83	0.86
Derivatized - MS/MS PE NeoGram	257	7.66	0.89	1.03	0.95	0.83
Non-derivatized MS/MS PE NeoGram	60	8.33	0.86	1.30	0.88	0.92
Lot 664 - Enriched 12 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	710	11.29	1.19	2.29	0.91	0.87
Non-derivatized MS/MS Non-Kit	50	11.22	0.98	1.25	0.83	0.86
Derivatized - MS/MS PE NeoGram	255	10.88	1.14	1.35	0.95	0.83
Non-derivatized MS/MS PE NeoGram	60	11.91	1.02	1.43	0.88	0.92

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2007 Quality Control Data
Summaries of Statistical Analyses

STEAROYL Carnitine ($\mu\text{mol C18/L}$ whole blood)

Method	N	Mean	Average Within Lab SD	Total SD	Y- Intercept*	Slope
Lot 661 - Nonenriched 0 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	617	0.88	0.13	0.24	0.88	0.81
Non-derivatized MS/MS Non-Kit	20	0.63	0.20	0.57	0.71	0.64
Derivatized - MS/MS PE NeoGram	237	0.85	0.13	0.19	0.90	0.82
Non-derivatized MS/MS PE NeoGram	45	0.82	0.09	0.10	0.90	0.79
Lot 662 - Enriched 1 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	614	1.68	0.20	0.44	0.88	0.81
Non-derivatized MS/MS Non-Kit	20	1.39	0.27	0.79	0.71	0.64
Derivatized - MS/MS PE NeoGram	234	1.76	0.26	0.33	0.90	0.82
Non-derivatized MS/MS PE NeoGram	45	1.71	0.14	0.17	0.90	0.79
Lot 663 - Enriched 2 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	617	2.50	0.31	0.67	0.88	0.81
Non-derivatized MS/MS Non-Kit	20	2.09	0.20	1.00	0.71	0.64
Derivatized - MS/MS PE NeoGram	235	2.56	0.33	0.43	0.90	0.82
Non-derivatized MS/MS PE NeoGram	44	2.61	0.23	0.24	0.90	0.79
Lot 664 - Enriched 5 $\mu\text{mol/L}$ whole blood						
Derivatized - MS/MS Non-Kit	620	4.93	0.61	1.40	0.88	0.81
Non-derivatized MS/MS Non-Kit	20	3.86	0.34	1.78	0.71	0.64
Derivatized - MS/MS PE NeoGram	234	5.00	0.65	0.85	0.90	0.82
Non-derivatized MS/MS PE NeoGram	45	4.82	0.45	0.61	0.90	0.79

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

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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