Newborn Screening
Quality Assurance Program

**Quality Control Specimen Certification, Acylcarnitines Set 2 — July 12, 2010**
**Transition (parallel testing) material**

ENRICHMENT LEVELS (endogenous levels not included)
**Acylcarnitines Method: MSMS Derivatized - MS/MS non-kit**

| *Analyte (µmol/L whole blood)* | Lot | *Base* | *Lot* | *Low* | *Lot* | *Intermediate* | *Lot* | *High* |
|---|---|---|---|---|---|---|---|---|
| Free carnitine (C0) | 965 | 0 | 966 | 10 | 967 | 20 | 968 | 30 |
| Acetylcarnitine (C2) | 965 | 0 | 966 | 10 | 967 | 20 | 968 | 30 |
| Propionylcarnitine (C3) | 965 | 0 | 966 | 3 | 967 | 7.5 | 968 | 12 |
| Butyrylcarnitine (C4) | 965 | 0 | 966 | 1 | 967 | 2.5 | 968 | 5 |
| Isovalerylcarnitine (C5) | 965 | 0 | 966 | 0.5 | 967 | 1.5 | 968 | 3 |
| Hexanoylcarnitine (C6) | 965 | 0 | 966 | 0.5 | 967 | 1.0 | 968 | 2.5 |
| Octanoylcarnitine (C8) | 965 | 0 | 966 | 0.5 | 967 | 1.0 | 968 | 2.5 |
| Decanoylcarnitine (C10) | 965 | 0 | 966 | 0.25 | 967 | 0.75 | 968 | 1.5 |
| Myristoylcarnitine (C14) | 965 | 0 | 966 | 0.5 | 967 | 1.5 | 968 | 3.0 |
| Palmitoylcarnitine (C16) | 965 | 0 | 966 | 4 | 967 | 8 | 968 | 12 |
| Stearoylcarnitine (C18) | 965 | 0 | 966 | 1 | 967 | 2 | 968 | 5 |
| Malonylcarnitine (C3DC) | 965 | 0 | 966 | 0.5 | 967 | 1.5 | 968 | 3 |
| Glutarylcarnitine (C5DC) | 965 | 0 | 966 | 0.5 | 967 | 1.0 | 968 | 2.5 |
| 3-Hydroxyisovalerylcarnitine (C5OH) | 965 | 0 | 966 | 0.5 | 967 | 1.5 | 968 | 2.5 |

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## Quality Control Specimen Certification, Acylcarnitines Set 2 — July 12, 2010
## Transition (parallel testing) material

ANALYTICAL INFORMATION *Lot Numbers, Mean Values ( $\bar{x}$, µmol/L whole blood), and 95% Confidence Limits (CL)*

| *Analyte* | *Lot* | *Mean/ 95% CL* | *Lot* | *Mean/ 95% CL* | *Lot* | *Mean/ 95% CL* | *Lot* | *Mean/ 95% CL* |
|---|---|---|---|---|---|---|---|---|
| C0 | 965 | $\bar{x}$ = 15.91<br>CL = 14.28-17.53 | 966 | $\bar{x}$ = 29.03<br>CL = 25.81-32.25 | 967 | $\bar{x}$ = 41.60<br>CL = 36.73-46.46 | 968 | $\bar{x}$ = 58.33<br>CL = 50.64-66.02 |
| C2 | 965 | $\bar{x}$ = 11.27<br>CL = 10.28-12.26 | 966 | $\bar{x}$ = 22.84<br>CL = 20.65-25.03 | 967 | $\bar{x}$ = 32.45<br>CL = 28.44-36.46 | 968 | $\bar{x}$ = 45.04<br>CL = 40.05-50.02 |
| C3 | 965 | $\bar{x}$ = 1.21<br>CL = 0.90-1.51 | 966 | $\bar{x}$ = 4.37<br>CL = 3.79-4.94 | 967 | $\bar{x}$ = 9.48<br>CL = 7.42-11.53 | 968 | $\bar{x}$ = 15.35<br>CL = 13.35-17.35 |
| C4 | 965 | $\bar{x}$ =0.13<br>CL = 0.06-0.19 | 966 | $\bar{x}$ = 0.98<br>CL = 0.81-1.14 | 967 | $\bar{x}$ = 2.45<br>CL = 1.90-3.00 | 968 | $\bar{x}$ = 5.07<br>CL = 3.76-6.39 |
| C5 | 965 | $\bar{x}$ = 0.08<br>CL = 0.02-0.14 | 966 | $\bar{x}$ = 0.56<br>CL = 0.44-0.68 | 967 | $\bar{x}$ = 1.36<br>CL = 1.11-1.61 | 968 | $\bar{x}$ = 2.92<br>CL = 2.47-3.36 |
| C6 | 965 | $\bar{x}$ = 0.04<br>CL = 0.00-0.07 | 966 | $\bar{x}$ = 0.44<br>CL = 0.33-0.56 | 967 | $\bar{x}$ = 0.84<br>CL = 0.60-1.08 | 968 | $\bar{x}$ = 2.29<br>CL = 2.09-2.50 |
| C8 | 965 | $\bar{x}$ = 0.02<br>CL = 0.01-0.04 | 966 | $\bar{x}$ = 0.53<br>CL = 0.38-0.68 | 967 | $\bar{x}$ = 1.02<br>CL = 0.75-1.29 | 968 | $\bar{x}$ = 2.92<br>CL =2.22-3.62 |
| C10 | 965 | $\bar{x}$ = 0.02<br>CL = 0.00-0.04 | 966 | $\bar{x}$ = 0.28<br>CL = 0.21-0.35 | 967 | $\bar{x}$ = 0.69<br>CL = 0.53-0.84 | 968 | $\bar{x}$ = 1.60<br>CL = 1.19-2.02 |
| C14 | 965 | $\bar{x}$ = 0.04<br>CL = 0.02-0.07 | 966 | $\bar{x}$ = 0.47<br>CL = 0.37-0.58 | 967 | $\bar{x}$ = 1.19<br>CL = 0.79-1.59 | 968 | $\bar{x}$ = 2.62<br>CL = 2.09-3.16 |
| C16 | 965 | $\bar{x}$ = 0.51<br>CL = 0.43-0.59 | 966 | $\bar{x}$ = 3.82<br>CL = 3.42-4.22 | 967 | $\bar{x}$ = 6.77<br>CL = 5.86-7.69 | 968 | $\bar{x}$ = 10.57<br>CL = 8.61-12.52 |
| C18 | 965 | $\bar{x}$ = 0.60<br>CL = 0.41-0.78 | 966 | $\bar{x}$ = 1.65<br>CL = 1.31-2.00 | 967 | $\bar{x}$ = 2.51<br>CL = 2.07-2.94 | 968 | $\bar{x}$ = 5.59<br>CL = 4.59-6.58 |
| C3DC | 965 | $\bar{x}$ = 0.04<br>CL = 0.01-0.06 | 966 | $\bar{x}$ = 0.61<br>CL = 0.40-0.81 | 967 | $\bar{x}$ = 1.46<br>CL = 1.00-1.92 | 968 | $\bar{x}$ = 2.88<br>CL = 2.40-3.35 |
| C5DC | 965 | $\bar{x}$ = 0.02<br>CL = 0.00-0.04 | 966 | $\bar{x}$ = 0.30<br>CL = 0.16-0.44 | 967 | $\bar{x}$ = 0.62<br>CL = 0.40-0.84 | 968 | $\bar{x}$ = 1.38<br>CL = 0.97-1.79 |
| C5OH | 965 | $\bar{x}$ = 0.53<br>CL = 0.39-0.66 | 966 | $\bar{x}$ = 0.93<br>CL = 0.75-1.12 | 967 | $\bar{x}$ = 1.72<br>CL = 1.47-1.98 | 968 | $\bar{x}$ = 2.70<br>CL = 2.36-3.05 |

**Note:** The values provided in the above tables are for reference use only. The mean value and confidence limits (CL) are determined by CDC for each Quality Control (QC) lot. Each participating laboratory must establish its own mean values and CL for its test method with these QC materials. Temporary estimates of mean values and CL can be determined after 10 successive, independent measurements. *Slazyk WE, Hannon WH. Quality assurance in the newborn screening laboratory. In: Therrell BL Jr, editor. Laboratory methods for neonatal screening. Washington (DC): American Public Health Association, 1993:23-46.*

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Quality Assurance Program

## Quality Control Specimen Certification, Acylcarnitines Set 2— July 12, 2010

ENRICHMENT LEVELS (endogenous levels not included)
**Acylcarnitines Method: MSMS Derivatized - MS/MS non-kit**

| *Analyte (µmol/L whole blood)* | Lot | *Base* | *Lot* | *Low* | *Lot* | *Intermediate* | *Lot* | *High* |
|---|---|---|---|---|---|---|---|---|
| Free carnitine (C0) | 061 | 0 | 062 | 10.0 | 063 | 20.0 | 064 | 30.0 |
| Acetylcarnitine (C2) | 061 | 0 | 062 | 10.3 | 063 | 20.6 | 064 | 31.0 |
| Propionylcarnitine (C3) | 061 | 0 | 062 | 3.5 | 063 | 8.7 | 064 | 13.9 |
| Butyrylcarnitine (C4) | 061 | 0 | 062 | 0.9 | 063 | 2.3 | 064 | 4.5 |
| Isovalerylcarnitine (C5) | 061 | 0 | 062 | 0.5 | 063 | 1.5 | 064 | 3.0 |
| Hexanoylcarnitine (C6) | 061 | 0 | 062 | 0.5 | 063 | 1.0 | 064 | 2.5 |
| Octanoylcarnitine (C8) | 061 | 0 | 062 | 0.5 | 063 | 1.1 | 064 | 2.6 |
| Decanoylcarnitine (C10) | 061 | 0 | 062 | 0.3 | 063 | 0.9 | 064 | 1.7 |
| Dodecanoylcarnitine (C12) | 061 | 0 | 062 | 0.2 | 063 | 0.5 | 064 | 1.1 |
| Myristoylcarnitine (C14) | 061 | 0 | 062 | 0.5 | 063 | 1.5 | 064 | 3.0 |
| Palmitoylcarnitine (C16) | 061 | 0 | 062 | 4.2 | 063 | 8.4 | 064 | 12.7 |
| Stearoylcarnitine (C18) | 061 | 0 | 062 | 1.2 | 063 | 2.3 | 064 | 5.8 |
| Malonylcarnitine (C3DC) | 061 | 0 | 062 | 0.5 | 063 | 1.6 | 064 | 3.3 |
| Glutarylcarnitine (C5DC) | 061 | 0 | 062 | 0.5 | 063 | 1.1 | 064 | 2.7 |
| 3-Hydroxyisovalerylcarnitine (C5OH) | 061 | 0 | 062 | 0.3 | 063 | 0.8 | 064 | 1.4 |
| 3-Hydroxypalmitoylcarnitine (C16OH) | 061 | 0 | 062 | 0.4 | 063 | 0.8 | 064 | 2.0 |

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ANALYTICAL INFORMATION *Lot Numbers, Mean Values ( $\bar{x}$, µmol/L whole blood), and 95% Confidence Limits (CL)*

| *Analyte* | *Lot* | *Mean/ 95% CL* | *Lot* | *Mean/ 95% CL* | *Lot* | *Mean/ 95% CL* | *Lot* | *Mean/ 95% CL* |
|---|---|---|---|---|---|---|---|---|
| C0 | 061 | $\bar{x}$ = 18.63<br>CL = 17.26-19.99 | 062 | $\bar{x}$ = 29.95<br>CL = 25.81-34.08 | 063 | $\bar{x}$ = 43.90<br>CL = 38.83-48.97 | 064 | $\bar{x}$ = 57.37<br>CL = 50.39-64.35 |
| C2 | 061 | $\bar{x}$ = 14.47<br>CL = 13.20-15.74 | 062 | $\bar{x}$ = 25.03<br>CL = 22.07-27.99 | 063 | $\bar{x}$ = 36.40<br>CL = 33.34-39.46 | 064 | $\bar{x}$ = 45.43<br>CL = 41.37-49.50 |
| C3 | 061 | $\bar{x}$ = 1.80<br>CL = 1.40-2.21 | 062 | $\bar{x}$ = 5.02<br>CL = 4.19-5.84 | 063 | $\bar{x}$ = 9.95<br>CL = 8.09-11.81 | 064 | $\bar{x}$ = 16.20<br>CL = 13.17-19.24 |
| C4 | 061 | $\bar{x}$ =0.14<br>CL = 0.11-0.18 | 062 | $\bar{x}$ = 0.90<br>CL = 0.67-1.12 | 063 | $\bar{x}$ = 1.97<br>CL = 1.68-2.26 | 064 | $\bar{x}$ = 3.68<br>CL = 3.23-4.14 |
| C5 | 061 | $\bar{x}$ = 0.08<br>CL = 0.06-0.11 | 062 | $\bar{x}$ = 0.53<br>CL = 0.40-0.66 | 063 | $\bar{x}$ = 1.46<br>CL = 1.19-1.72 | 064 | $\bar{x}$ = 2.72<br>CL = 2.35-3.08 |
| C6 | 061 | $\bar{x}$ = 0.03<br>CL = 0.00-0.06 | 062 | $\bar{x}$ = 0.41<br>CL = 0.30-0.52 | 063 | $\bar{x}$ = 0.82<br>CL = 0.66-0.99 | 064 | $\bar{x}$ = 1.98<br>CL = 1.69-2.26 |
| C8 | 061 | $\bar{x}$ = 0.04<br>CL = 0.01-0.06 | 062 | $\bar{x}$ = 0.54<br>CL = 0.37-0.72 | 063 | $\bar{x}$ = 1.05<br>CL = 0.80-1.30 | 064 | $\bar{x}$ = 2.55<br>CL =2.06-3.03 |
| C10 | 061 | $\bar{x}$ = 0.02<br>CL = 0.00-0.05 | 062 | $\bar{x}$ = 0.31<br>CL = 0.17-0.45 | 063 | $\bar{x}$ = 0.86<br>CL = 0.62-1.11 | 064 | $\bar{x}$ = 1.70<br>CL = 1.46-1.94 |
| C12 | 061 | $\bar{x}$ = 0.03<br>CL = 0.01-0.05 | 062 | $\bar{x}$ = 0.26<br>CL = 0.21-0.31 | 063 | $\bar{x}$ = 0.57<br>CL = 0.38-0.76 | 064 | $\bar{x}$ = 1.23<br>CL = 0.96-1.49 |
| C14 | 061 | $\bar{x}$ = 0.09<br>CL = 0.05-0.13 | 062 | $\bar{x}$ = 0.56<br>CL = 0.44-0.68 | 063 | $\bar{x}$ = 1.55<br>CL = 1.17-1.93 | 064 | $\bar{x}$ = 2.81<br>CL = 2.24-3.38 |
| C16 | 061 | $\bar{x}$ = 0.94<br>CL = 0.77-1.11 | 062 | $\bar{x}$ = 4.60<br>CL = 3.71-5.49 | 063 | $\bar{x}$ = 7.88<br>CL = 6.88-8.88 | 064 | $\bar{x}$ = 11.17<br>CL = 9.56-12.78 |
| C18 | 061 | $\bar{x}$ = 0.69<br>CL = 0.52-0.85 | 062 | $\bar{x}$ = 1.62<br>CL = 1.29-1.94 | 063 | $\bar{x}$ = 2.53<br>CL = 2.21-2.85 | 064 | $\bar{x}$ = 5.12<br>CL = 4.25-5.99 |
| C3DC | 061 | $\bar{x}$ = 0.03<br>CL = 0.00-0.06 | 062 | $\bar{x}$ = 0.47<br>CL = 0.35-0.59 | 063 | $\bar{x}$ = 1.29<br>CL = 0.97-1.61 | 064 | $\bar{x}$ = 2.57<br>CL = 2.26-2.88 |
| C5DC | 061 | $\bar{x}$ = 0.02<br>CL = 0.00-0.05 | 062 | $\bar{x}$ = 0.41<br>CL = 0.25-0.57 | 063 | $\bar{x}$ = 0.70<br>CL = 0.56-0.85 | 064 | $\bar{x}$ = 1.86<br>CL = 1.48-2.24 |
| C5OH | 061 | $\bar{x}$ = 0.54<br>CL = 0.38-0.69 | 062 | $\bar{x}$ = 0.74<br>CL = 0.56-091 | 063 | $\bar{x}$ = 1.20<br>CL = 1.01-1.38 | 064 | $\bar{x}$ = 1.61<br>CL = 1.34-1.87 |
| C16OH | 061 | $\bar{x}$ = 0.01<br>CL = 0.00-0.02 | 062 | $\bar{x}$ = 0.28<br>CL = 0.21-0.35 | 063 | $\bar{x}$ = 0.57<br>CL = 0.47-0.66 | 064 | $\bar{x}$ = 1.39<br>CL = 1.20-1.58 |

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