
Wadsworth Center

New York State Department of Health

BLOOD LEAD

Proficiency Test Report

Event #2, 2010

June 1, 2010



Wadsworth Center The Governor Nelson A. Rockefeller Empire State Plaza P.O. Box 509 Albany, New York 12201-0509

Richard F. Daines, M.D.
Commissioner

James W. Clyne, Jr.,
Executive Deputy Commissioner

June 1, 2010

TOXICOLOGY – Blood Lead
Event #2, 2010

Dear Laboratory Director:

A statistical summary report for all proficiency test (PT) results evaluated in the second blood lead event of 2010 is enclosed. A confidential three-digit code number assigned by the PT program identifies participating laboratories. Each laboratory will receive an individual performance summary for the last three PT test events under separate cover. To pass the PT for Blood Lead, a laboratory must achieve a minimum score of 80% (4 out of 5 correct) on two consecutive testing events, or two out of three consecutive testing events. Summary reports for Trace Elements in Whole Blood (other than Blood Lead) will be distributed shortly.

PT Materials

The blood-based test materials were obtained from lead-dosed goats prior to the test. On Tuesday, April 27th, 2010, 400-500 mL of blood were drawn from each animal into a blood bag containing 750 mg K₂EDTA. The animals provided pools with lead concentrations ranging from 3 µg/dL to 53 µg/dL. Aliquots of whole blood were transferred into cryovials, and shipped to participating laboratories Wednesday, Wednesday April 28th, 2010. PT samples for laboratories using the LeadCare[®] system were shipped by overnight express for delivery Wednesday, Wednesday 28th, 2010. Target values were established by a ≥90% consensus of 19 measurements performed by 17 reference laboratories using ICP-MS, ETAAS and ASV methods.

Certification for CLIA '88 and OSHA Purposes

Laboratories outside of New York State can have their PT results from this program evaluated for federal regulatory purposes under CLIA '88. The laboratory director should notify the regional CMS office, and should provide our program with the address to which PT results should be sent. Participation in this program may also be used to obtain approval for blood lead testing from the Occupational Safety and Health Administration (OSHA), U.S. Dept. of Labor. For further information on OSHA approval, contact: James S. Pike at 801-233-4927.

The next PT event for blood lead is scheduled to be mailed Wednesday, September 22nd, 2010. PT samples for laboratories using the LeadCare[®] system are scheduled to be shipped by overnight express for delivery September 22nd, 2010. Please inform our laboratory staff at (518) 474-4484 if the test materials have not arrived within five days of the scheduled mail out date. The deadline for reporting results is Wednesday, October 13th, 2010.

Thank you for your participation.

Sincerely,

A handwritten signature in black ink, appearing to read 'Patrick J. Parsons'. The signature is fluid and cursive, with a large initial 'P'.

Patrick J. Parsons, Ph.D.
Section Head, Blood Lead Proficiency Testing Program

**New York State Department of Health
Blood Lead Test Results, 2010 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE10-06	BE10-07	BE10-08	BE10-09	BE10-10		
Target values:		3	17	33	53	11		
103	ASV-LeadCare	3	17	33	53	9	1.00	Info
103	DRC/CC-ICP-MS	3	16	32	51	10	0.96	
104	ETAAS-Z	4	18	34	56	3 ↓	1.05	Info
106	ICP-MS	3	17	33	54	11	1.00	Info
107	ICP-MS	3	17	34	55	11	1.02	
107	ASV-LeadCare	<3	15	30	52	8	0.92	Info
108	ETAAS-Z	4	18	35	56	12	1.07	
109	ETAAS-Z	4	19	37	56	12	1.10	
109	ICP-MS	3	17	33	52	10	0.99	
109	ASV-LeadCare	3	16	33	56	9	1.00	Info
109	ASV-LeadCare	<3	16	31	51	9	0.95	Info
110	ETAAS-Z	3	18	33	56	11	1.03	
110	ASV-LeadCare	3	16	33	54	9	0.99	Info
110	ASV-LeadCare	<3	18	34	54	9	1.04	Info
110	ICP-MS	3	17	34	54	11	1.01	
112	ASV-3010	<2	13	29	49	9	0.86	
114	ETAAS-Z	4	19	36	56	12	1.09	
116	ICP-MS	2	17	34	54	10	1.02	Info
121	ETAAS-Z	3	17	33	53	11	1.00	Info
123	ETAAS-Z	4	17	33	52	11	1.00	
126	ETAAS-Z	3	17	33	56	11	1.01	
131	ETAAS-Z	<2	20	33	50	12	1.05	
132	ETAAS-Z	3	18	34	53	11	1.02	
143	ETAAS-Z	2	15	31	50	10	0.92	
144	ETAAS-Z	2	16	33	50	9	0.96	
146	ETAAS-Z	3	17	34	49	10	0.98	
147	ICP-MS	3	17	33	53	11	1.00	
150	ASV-LeadCare	3	15	27 ↓	45 ↓	9	0.85	
156	ICP-MS	2	16	32	50	11	0.96	
158	ETAAS-Z	3	18	34	54	12	1.05	

notes: ↑ reported value outside upper limit
↓ reported value outside lower limit

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
Info only: results included for informational purposes only.

**New York State Department of Health
Blood Lead Test Results, 2010 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE10-06	BE10-07	BE10-08	BE10-09	BE10-10		
Target values:		3	17	33	53	11		
159	ICP-MS	3	18	34	52	11	1.02	
160	ETAAS-Z	5	23 ↑	39 ↑	53	13	1.18	
164	ICP-MS	3	16	32	50	11	0.96	
166	ASV-3010	3	16	35	55	11	1.01	
168	ETAAS-Z	4	17	36	54	11	1.03	
179	ICP-MS	3	18	34	55	11	1.03	
197	ICP-MS	4	17	34	54	11	1.01	
198	ETAAS-Z	3	17	33	52	11	1.00	
199	ETAAS-Z	3	17	32	50	11	0.98	
200	ETAAS-Z	4	19	35	54	11	1.05	
204	ASV-3010	2	12 ↓	31	50	8	0.86	
206	ICP-MS	3	17	35	55	11	1.02	
208	ETAAS-Z	3	17	25 ↓	45 ↓	12	0.92	
215	ETAAS-Z	5	17	32	49	11	0.97	
221	ETAAS-Z	4	17	31	49	11	0.97	
232	ASV-3010	2	15	36	55	9	1.00	
237	ETAAS-Z	3	16	32	50	10	0.95	
243	ASV-3010	1	14	34	53	9	0.95	
249	ASV-3010	2	15	34	53	10	0.97	
254	ETAAS-Z	3	18	33	58	10	1.05	
255	ETAAS-Z	3	18	34	54	11	1.03	
261	ETAAS-Z	3	16	32	49	10	0.95	
269	ETAAS-Z	3	17	33	52	11	1.00	
271	ASV-3010	5	14	33	56	14	1.04	
272	ETAAS-Z	3	17	35	54	11	1.02	
279	ETAAS-Z	3	15	32	54	9	0.96	
282	ASV-3010	1	14	32	48	8	0.90	
290	ICP-MS	3	16	32	50	10	0.95	
291	ASV-3010	4	16	33	54	10	0.99	
293	ICP-MS	3	16	26 ↓	49	10	0.88	Info

notes: ↑ reported value outside upper limit
↓ reported value outside lower limit

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
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**New York State Department of Health
Blood Lead Test Results, 2010 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE10-06	BE10-07	BE10-08	BE10-09	BE10-10		
Target values:		3	17	33	53	11		
295	ASV-3010	1	14	33	52	9	0.93	
300	ASV-3010	<3	16	35	57	11	1.02	
301	ETAAS-Z	2	15	29	48	9	0.89	
305	ETAAS-Z	3	16	30	51	10	0.94	
312	ICP-MS	3	17	34	54	11	1.01	
317	ETAAS-Z	13 ↑	17	33	53	11	1.67	
324	ICP-MS	4	18	32	56	11	1.02	
325	ETAAS-Z	6	16	30	45 ↓	10	0.90	Info
333	ETAAS-Z	4	17	34	53	11	1.01	
339	HR-ICP-MS	3	16	31	49	10	0.94	Info
340	ETAAS-Z	4	18	34	51	11	1.01	
343	ASV-LeadCare	3	14	31	51	8	0.91	Info
348	ETAAS-Z	3	19	37	58	11	1.08	
349	ETAAS-Z	3	19	35	57	11	1.06	
350	ASV-3010	3	16	33	52	15	1.07	
352	ASV-3010	4	19	37	60 ↑	12	1.12	
353	ETAAS-Z	3	14	29	45 ↓	9	0.85	
359	ICP-MS	3	13	28 ↓	49	9	0.85	
365	ETAAS-Z	3	16	31	50	9	0.94	
366	ETAAS-Z	3	17	31	50	11	0.97	Info
367	ETAAS-Z	3	18	36	56	12	1.07	Info
368	ASV-3010	4	21	36	52	12	1.10	
369	ASV-3010	3	16	37	58	11	1.04	
374	ASV-3010	3	16	36	56	12	1.04	
376	ASV-LeadCare	2	13	31	49	8	0.88	
383	ETAAS-Z	3	16	31	48	10	0.93	
384	ASV-3010	<1	14	32	52	8	0.92	
385	ICP-MS	4	18	34	55	11	1.03	Info
388	ASV-LeadCare	2	18	40 ↑	59 ↑	9	1.13	
389	ETAAS-Z	3	17	33	53	11	1.00	

notes: ↑ reported value outside upper limit
↓ reported value outside lower limit

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
Info only: results included for informational purposes only.

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Blood Lead Test Results, 2010 Event #2
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE10-06	BE10-07	BE10-08	BE10-09	BE10-10		
Target values:		3	17	33	53	11		
391	ETAAS-Z	3	17	34	52	11	1.00	Info
395	ICP-MS	2	16	31	51	10	0.95	
401	ETAAS-Z	4	19	35	56	12	1.08	Info
408	ICP-MS	3	16	31	49	10	0.94	Info
410	ICP-MS	3	17	35	55	11	1.02	Info
449	ASV-LeadCare	3	16	3 ↓	4 ↓	1 ↓	0.94	Info
453	ETAAS-Z	2	16	32	53	10	0.97	
455	ASV-LeadCare	<3	14	31	50	9	0.90	
456	ASV-LeadCare	<3	14	33	51	7	0.93	
461	ASV-3010	<1	13	30	49	9	0.87	

Percent satisfactory results for all participants: 96.2 %

notes: ↑ reported value outside upper limit
↓ reported value outside lower limit

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
Info only: results included for informational purposes only.

**New York State Department of Health
Blood Lead Test Results, 2010 Event #2
STATISTICAL SUMMARY**

TARGET VALUE ASSIGNMENT AND STATISTICS						
Lab Code	Method	Results (µg/dL whole blood)				
		BE10-06	BE10-07	BE10-08	BE10-09	BE10-10
103	DRC/CC-ICP-MS	3	16	32	51	10
107	ICP-MS	3	17	34	55	11
109	ETAAS-Z	4	19	37	56	12
109	ICP-MS	3	17	33	52	10
110	ETAAS-Z	3	18	33	56	11
110	ICP-MS	3	17	34	54	11
112	ASV-3010	<2	13	29	49	9
147	ICP-MS	3	17	33	53	11
156	ICP-MS	2	16	32	50	11
159	ICP-MS	3	18	34	52	11
164	ICP-MS	3	16	32	50	11
166	ASV-3010	3	16	35	55	11
179	ICP-MS	3	18	34	55	11
198	ETAAS-Z	3	17	33	52	11
199	ETAAS-Z	3	17	32	50	11
200	ETAAS-Z	4	19	35	54	11
243	ASV-3010	1	14	34	53	9
324	ICP-MS	4	18	32	56	11
350	ASV-3010	3	16	33	52	15
Number of Sample Measurements:		18	19	19	19	19
Mean (target value):		3	17	33	53	11
Standard Deviation:		0.7	1.5	1.7	2.3	1.2
RSD (%):		22.9	9.0	5.0	4.3	11.2
Acceptable Range:						
Upper Limit:		7	21	37	58	15
Lower Limit:		0	13	29	48	7

notes: Results reported as less than the detection limits are treated as zero for statistical and grading purposes.

**New York State Department of Health
Blood Lead Test Results, 2010 Event #2
STATISTICAL SUMMARY BY METHOD**

		Results (µg/dL whole blood)				
		BE10-06	BE10-07	BE10-08	BE10-09	BE10-10
ASV-3010						
Number of Sample Measurements:		14	18	18	18	18
Mean:		2.7	15.2	33.7	53.4	10.4
Standard Deviation:		1.3	2.2	2.3	3.3	2.0
RSD (%):		46.7	14.2	6.9	6.2	19.6
ASV-LeadCare						
Number of Sample Measurements:		8	13	12	12	12
Mean:		2.8	15.5	32.3	52.1	8.6
Standard Deviation:		0.5	1.6	3.1	3.6	0.7
RSD (%):		16.8	10.0	9.5	6.8	7.8
DRC/CC-ICP-MS						
Number of Sample Measurements:		1	1	1	1	1
Mean:		3.0	16.0	32.0	51.0	10.0
Standard Deviation:		?	?	?	?	?
RSD (%):		—	—	—	—	—
ETAAS-Z						
Number of Sample Measurements:		43	46	46	46	46
Mean:		3.3	17.3	33.1	52.2	10.6
Standard Deviation:		0.7	1.5	2.4	3.3	1.5
RSD (%):		21.3	8.8	7.3	6.4	13.9
HR-ICP-MS						
Number of Sample Measurements:		1	1	1	1	1
Mean:		3.0	16.0	31.0	49.0	10.0
Standard Deviation:		?	?	?	?	?
RSD (%):		—	—	—	—	—
ICP-MS						
Number of Sample Measurements:		21	21	21	21	21
Mean:		3.0	16.7	32.6	52.7	10.6
Standard Deviation:		0.5	1.1	2.2	2.4	0.6
RSD (%):		18.3	6.6	6.8	4.5	5.6
All Laboratories						
Number of Sample Measurements:		88	100	99	99	99
Mean:		3.1	16.5	32.9	52.5	10.3
Standard Deviation:		0.8	1.8	2.4	3.1	1.5
RSD (%):		25.5	10.6	7.4	6.0	14.6

notes: ? Insufficient data for calculation.

**New York State Department of Health
Blood Lead Test Results, 2010 Event #2
STATISTICAL SUMMARY BY CLASS**

Results ($\mu\text{g/dL}$ whole blood)					
	BE10-06	BE10-07	BE10-08	BE10-09	BE10-10
Evaluated					
Number of Sample Measurements:	52	59	58	58	58
Mean:	3.1	16.4	33.1	52.3	10.3
Standard Deviation:	0.9	2.0	2.7	3.5	1.4
RSD (%):	28.7	12.3	8.2	6.7	13.3
Info					
Number of Sample Measurements:	18	22	22	22	22
Mean:	3.1	16.7	32.5	52.6	9.7
Standard Deviation:	0.5	1.1	2.2	2.9	1.9
RSD (%):	17.6	6.8	6.8	5.5	19.3
Reference					
Number of Sample Measurements:	18	19	19	19	19
Mean:	3.0	16.8	33.2	52.9	10.9
Standard Deviation:	0.7	1.5	1.7	2.3	1.2
RSD (%):	22.9	9.0	5.0	4.3	11.2
All Laboratories					
Number of Sample Measurements:	88	100	99	99	99
Mean:	3.1	16.5	32.9	52.5	10.3
Standard Deviation:	0.8	1.8	2.4	3.1	1.5
RSD (%):	25.5	10.6	7.4	6.0	14.6

notes: ? Insufficient data for calculation.

**New York State Department of Health
Blood Lead Test Results, 2010 Event #2**

METHOD NOTES

ATOMIC SPECTROMETRY METHODS

- A-1 ETAAS-Z (Electrothermal atomic absorption spectrometry with Zeeman background correction)
- A-2 ETAAS other (i.e., D₂, S-H background correction)
- A-3 FAAS (Flame atomic absorption spectrometry)
- A-4 CV-AAS (Cold vapor atomic absorption spectrometry)
- A-5 HG-AAS (Hydride generation atomic absorption spectrometry)
- A-6 AFS (Atomic fluorescence spectrometry)
- A-7 Other

INDUCTIVELY COUPLED PLASMA

- P-1 ICP-MS (Inductively coupled plasma - mass spectrometry)
- P-2 DRC/CC-ICP-MS (ICP-MS used in the Dynamic Reaction Cell or Collision Cell mode)
- P-3 ICP-AES/OES (ICP atomic/optical emission spectrometry)
- P-4 HR-ICP-MS (High resolution ICP-MS)
- P-5 ETV-ICP-MS (Electrothermal vaporization ICP-MS)
- P-6 ID-ICP-MS (Isotope dilution ICP-MS)
- P-7 Other

ELECTROCHEMICAL METHODS

- E-1 ASV (Anodic stripping voltammetry without digestion)
- E-2 ASV-LeadCare® (Anodic stripping voltammetry using the ESA LeadCare® system)
- E-3 Fluoride specific electrode
- E-4 Other

MOLECULAR FLUORIMETRY

- F-1 EtOAc (Ethyl acetate-acetic acid extraction method for determination of erythrocyte protoporphyrin)
- F-2 Aviv hematofluorometry (for determination of EP at hematocrit 35)
- F-3 Helena ZPP (for determination of zinc protoporphyrin in $\mu\text{mol ZPP/mol heme}$)
- F-4 Other

OTHER METHODS

If your method is not listed in the above list, please describe it briefly.
