Wadsworth Center

New York State Department of Health

BLOOD LEAD

Proficiency Test Report

Event #1, 2012

March 5, 2012

NEW YORK
state department of
HEALTH

Nirav R. Shah, M.D., M.P.H.
Commissioner

Sue Kelly
Executive Deputy Commissioner

March 5, 2012

TOXICOLOGY – Blood Lead
Event #1, 2012

Dear Laboratory Director:

A statistical summary report for all proficiency test (PT) results evaluated in the first blood lead event of 2012 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, January 24th, 2012, 400-500 mL of blood were drawn from each animal into a blood bag containing 750 mg K_2EDTA. The animals provided pools with lead concentrations ranging from 5 μg/dL to 45 μg/dL. Aliquots of whole blood were transferred into cryovials, and shipped to participating laboratories Wednesday, January 25th, 2012. PT samples for laboratories using the LeadCare® system were shipped by overnight express for delivery Wednesday, January 25th, 2012. Target values were established by a ≥90% consensus of 22 measurements performed by 20 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.

Scheduled PT Events

Samples are scheduled to be mailed Wednesday, May 9th, 2012. The laboratory is required to notify the section (trel@wadsworth.org) within five days of shipment that samples have not arrived or are unacceptable for testing. For laboratories using the LeadCare® system samples are scheduled to be mailed Tuesday, May 8th, 2012, for delivery Wednesday, May 9th, 2012. These laboratories are required to notify the section (trel@wadsworth.org) by 12:00 pm (EST) Wednesday, May 9th, 2012, that samples have not arrived or are unacceptable for testing. Failure to notify the section will result in a score of zero. The deadline for reporting results is Wednesday, May 30th, 2012.

Sincerely,

Patrick J. Parsons, Ph.D.
Chief, Laboratory of Inorganic and Nuclear Chemistry
Deputy Director, Division of Environmental Health Sciences

Mary Frances Verostek, Ph.D.
Assistant Section Head
PT Program for Blood Lead/Trace Elements.

New York State Department of Health
Blood Lead Test Results, 2012 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE12-01	BE12-02	BE12-03	BE12-04	BE12-05		
	Target values:	5	22	10	20	45		
103	DRC/CC-ICP-MS	5	23	9	20	47	1.03	
104	ETAAS-Z	8	22	9	19	41	0.95	
107	DRC/CC-ICP-MS	5	23	9	20	48	1.04	
107	ASV-LeadCare	5	24	9	20	46	1.04	Info
109	ETAAS-Z	4	22	9	20	45	1.00	
109	ICP-MS	5	22	9	19	46	0.99	
109	ASV-LeadCare	5	23	8	19	41	0.97	Info
109	ASV-LeadCare	5	23	9	21	43	1.02	Info
110	ETAAS-Z	6	24	10	21	47	1.06	
110	ASV-LeadCare	5	24	9	21	46	1.05	Info
110	ASV-LeadCare	5	27 ↑	12	19	50	1.12	Info
110	ICP-MS	5	22	9	20	46	1.01	
112	ETAAS-Z	3	18	8	15 ↓	33 ↓	0.77	
114	ETAAS-Z	5	21	9	19	44	0.96	
116	ICP-MS	5	22	9	19	46	0.99	Info
121	ETAAS-Z	4	17 ↓	7	15 ↓	32 ↓	0.74	Info
123	ETAAS-Z	6	21	9	17	42	0.91	
126	ETAAS-Z	6	25	10	23	44	1.09	
131	ETAAS-Z	6	23	9	17	43	0.95	
143	ETAAS-Z	4	19	8	17	40 ↓	0.87	
144	ETAAS-Z	4	23	9	20	46	1.02	
146	ETAAS-Z	5	22	8	18	42	0.94	
147	ICP-MS	5	21	9	19	44	0.96	
150	ASV-LeadCare	4	>8	7	>8	>8	?.?	
156	ICP-MS	4	20	8	18	43	0.92	
158	ICP-MS	6	23	10	20	46	1.02	
159	ICP-MS	5	22	9	20	44	0.99	
160	ETAAS-Z	5	22	10	22	43	1.02	
164	ICP-MS	5	22	9	19	45	0.98	
166	ASV-3010	6	22	10	20	45	1.00	
168	ETAAS-Z	6	23	10	21	46	1.04	

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, 2012 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood) BE12-01	BE12-02	BE12-03	BE12-04	BE12-05	Normalized Mean	Info Only
	Target values:	5	22	10	20	45		
179	ICP-MS	5	22	9	19	45	0.98	
197	ICP-MS	5	22	8	19	44	0.98	
198	ETAAS-Z	6	23	10	21	42	1.01	
199	ETAAS-Z	5	24	11	21	48	1.08	
200	ETAAS-Z	5	23	9	20	43	1.00	
204	ASV-3010	4	20	6	16	48	0.93	
206	ICP-MS	5	22	10	19	46	0.99	
208	ETAAS-Z	7	24	9	20	44	1.02	
221	ETAAS-Z	5	23	10	20	44	1.01	
232	ASV-3010	6	23	11	19	46	1.03	
237	ETAAS-Z	5	22	9	19	46	0.99	
243	ASV-3010	5	22	9	20	47	1.01	
254	ETAAS-Z	5	24	10	21	47	1.06	
255	ETAAS-Z	5	22	9	19	45	0.98	
261	ETAAS-Z	5	22	9	19	45	0.98	
269	ETAAS-Z	4	19	7	17	39 ↓	0.86	
271	ASV-3010	4	20	7	18	39 ↓	0.89	
272	ETAAS-Z	5	22	10	20	45	1.00	
279	ETAAS-Z	4	20	8	18	43	0.92	
282	ASV-3010	6	24	11	21	39 ↓	1.03	
290	ICP-MS	5	21	9	17	41	0.91	
291	ASV-3010	6	24	10	20	52 ↑	1.08	
293	ICP-MS	5	22	12	18	44	1.02	
295	ASV-3010	8	24	11	20	48	1.06	
301	ETAAS Other	4	20	8	15 ↓	44	0.88	
305	ETAAS-Z	5	20	9	18	42	0.91	
312	ICP-MS	5	24	9	20	48	1.05	
317	ETAAS-Z	6	21	9	19	43	0.95	
324	HR-ICP-MS	5	22	9	19	42	0.96	
325	ETAAS-Z	5	21	9	19	50	1.01	
333	ETAAS-Z	5	22	9	20	44	0.99	

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, 2012 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		BE12-01	BE12-02	BE12-03	BE12-04	BE12-05		
	Target values:	5	22	10	20	45		
337	ASV-LeadCare	5	22	9	21	47	1.03	
339	HR-ICP-MS	5	22	9	18	44	0.96	Info
340	ETAAS-Z	4	22	8	19	45	0.98	
343	ASV-LeadCare	5	23	8	20	42	0.99	Info
348	ETAAS-Z	5	24	10	22	47	1.08	
349	ETAAS-Z	5	23	9	19	45	1.00	
350	ASV-3010	9	26	13	22	48	1.16	
352	ASV-3010	4	23	10	20	45	1.02	
353	ETAAS-Z	4	25	9	20	45	1.05	
365	ETAAS-Z	5	22	9	20	43	0.99	
366	ETAAS-Z	6	22	8	23	43	1.04	Info
367	DRC/CC-ICP-MS	5	23	9	20	47	1.03	Info
368	ASV-3010	4	20	8	19	42	0.93	
369	ASV-3010	4	22	9	18	45	0.97	
374	ASV-3010	4	20	7	17	44	0.91	
383	ETAAS-Z	5	22	9	19	44	0.98	
384	ASV-3010	4	20	9	19	39 ↓	0.91	
388	ASV-3010	3	21	9	17	44	0.93	
389	ETAAS-Z	5	22	9	20	45	1.00	
391	ETAAS-Z	6	25	11	21	50	1.10	Info
393	ASV-LeadCare	4	24	7	21	>37	1.07	
401	ETAAS-Z	6	25	10	22	50	1.12	Info
410	ICP-MS	5	23	9	20	47	1.03	Info
461	ASV-3010	4	21	8	18	44	0.94	
463	ASV-LeadCare	4	25	9	21	53 ↑	1.12	
464	ASV-LeadCare	5	26	9	23	48	1.13	
469	ICP-MS	6	42 ↑	16 ↑	40 ↑	105 ↑	1.96	
470	ASV-LeadCare	4	24	8	21	47	1.06	

Percent satisfactory results for all participants: 96.0 %

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, 2012 Event #1
STATISTICAL SUMMARY

Lab Code	Method	TARGET VALUE ASSIGNMENT AND STATISTICS Results (µg/dL whole blood) BE12-01	BE12-02	BE12-03	BE12-04	BE12-05
103	DRC/CC-ICP-MS	5	23	9	20	47
104	ETAAS-Z	8	22	9	19	41
107	DRC/CC-ICP-MS	5	23	9	20	48
109	ETAAS-Z	4	22	9	20	45
109	ICP-MS	5	22	9	19	46
110	ETAAS-Z	6	24	10	21	47
110	ICP-MS	5	22	9	20	46
147	ICP-MS	5	21	9	19	44
156	ICP-MS	4	20	8	18	43
159	ICP-MS	5	22	9	20	44
160	ETAAS-Z	5	22	10	22	43
164	ICP-MS	5	22	9	19	45
166	ASV-3010	6	22	10	20	45
179	ICP-MS	5	22	9	19	45
198	ETAAS-Z	6	23	10	21	42
199	ETAAS-Z	5	24	11	21	48
200	ETAAS-Z	5	23	9	20	43
243	ASV-3010	5	22	9	20	47
293	ICP-MS	5	22	12	18	44
324	HR-ICP-MS	5	22	9	19	42
325	ETAAS-Z	5	21	9	19	50
350	ASV-3010	9	26	13	22	48
Number of Sample Measurements:		22	22	22	22	22
Mean (target value):		**5**	**22**	**10**	**20**	**45**
Standard Deviation:		1.1	1.2	1.1	1.1	2.3
RSD (%):		21.2	5.4	12.0	5.5	5.2
Acceptable Range:						
Upper Limit:		9	26	14	24	50
Lower Limit:		1	18	6	16	41

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, 2012 Event #1
STATISTICAL SUMMARY BY METHOD

	Results (µg/dL whole blood)				
	BE12-01	BE12-02	BE12-03	BE12-04	BE12-05
ASV-3010					
Number of Sample Measurements:	15	16	16	16	16
Mean:	4.8	22.0	9.3	19.0	44.7
Standard Deviation:	1.3	1.9	1.8	1.6	3.6
RSD (%):	27.5	8.5	19.5	8.4	8.2
ASV-LeadCare					
Number of Sample Measurements:	12	11	12	11	10
Mean:	4.7	24.1	8.7	20.6	46.3
Standard Deviation:	0.5	1.4	1.3	1.1	3.7
RSD (%):	10.6	6.0	15.0	5.4	7.9
DRC/CC-ICP-MS					
Number of Sample Measurements:	3	3	3	3	3
Mean:	5.0	23.0	9.0	20.0	47.3
Standard Deviation:	0.0	0.0	0.0	0.0	0.6
RSD (%):	—	—	—	—	—
ETAAS Other					
Number of Sample Measurements:	1	1	1	1	1
Mean:	4.0	20.0	8.0	15.0	44.0
Standard Deviation:	?	?	?	?	?
RSD (%):	—	—	—	—	—
ETAAS-Z					
Number of Sample Measurements:	40	40	40	40	40
Mean:	5.1	22.2	9.1	19.5	43.9
Standard Deviation:	0.9	1.8	0.9	1.9	3.6
RSD (%):	18.3	8.3	9.9	9.5	8.2
HR-ICP-MS					
Number of Sample Measurements:	2	2	2	2	2
Mean:	5.0	22.0	9.0	18.5	43.0
Standard Deviation:	0.0	0.0	0.0	0.7	1.4
RSD (%):	—	—	—	—	—
ICP-MS					
Number of Sample Measurements:	16	15	16	15	15
Mean:	5.1	22.0	9.6	19.1	45.0
Standard Deviation:	0.4	0.9	1.9	0.9	1.7
RSD (%):	8.7	4.2	20.0	4.6	3.8
All Laboratories					
Number of Sample Measurements:	89	88	90	88	87
Mean:	5.0	22.3	9.1	19.4	44.6
Standard Deviation:	0.9	1.7	1.4	1.7	3.3
RSD (%):	17.7	7.8	14.8	8.5	7.5

notes: ? Insufficient data for calculation.

New York State Department of Health
Blood Lead Test Results, 2012 Event #1
STATISTICAL SUMMARY BY CLASS

	Results (µg/dL whole blood)				
	BE12-01	BE12-02	BE12-03	BE12-04	BE12-05
Evaluated					
Number of Sample Measurements:	54	52	54	52	51
Mean:	4.9	22.1	9.0	19.1	44.3
Standard Deviation:	1.0	1.8	1.4	1.7	3.3
RSD (%):	19.8	8.0	16.0	9.1	7.4
Info					
Number of Sample Measurements:	14	14	14	14	14
Mean:	5.1	23.1	9.1	19.9	44.8
Standard Deviation:	0.5	2.2	1.3	1.9	4.7
RSD (%):	10.4	9.7	14.0	9.6	10.5
Reference					
Number of Sample Measurements:	21	22	22	22	22
Mean:	5.2	22.4	9.5	19.8	45.1
Standard Deviation:	0.8	1.2	1.1	1.1	2.3
RSD (%):	15.7	5.4	12.0	5.5	5.2
All Laboratories					
Number of Sample Measurements:	89	88	90	88	87
Mean:	5.0	22.3	9.1	19.4	44.6
Standard Deviation:	0.9	1.7	1.4	1.7	3.3
RSD (%):	17.7	7.8	14.8	8.5	7.5

notes: ? Insufficient data for calculation.

New York State Department of Health
Blood Lead Test Results, 2012 Event #1
METHOD NOTES

ATOMIC SPECTROMETRY METHODS

A-1 ETAAS-Z (Electrothermal atomic absorption spectrometry with Zeeman background correction)

A-2 ETAAS other (i.e., D_2, 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 μmol ZPP/mol heme)

F-4 Other

OTHER METHODS

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