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**Wadsworth Center**

New York State Department of Health

**BLOOD LEAD**

**Proficiency Test Report**

**Event #3, 2005**

**November 14, 2005**

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# STATE OF NEW YORK DEPARTMENT OF HEALTH

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

Antonia C. Novello, M.D., M.P.H.  
Commissioner

Dennis P. Whalen  
Executive Deputy Commissioner

November 14, 2005

## TOXICOLOGY - BLOOD LEAD Event #3, 2005

Dear Laboratory Director:

A statistical summary report for all proficiency test (PT) results evaluated in the third Blood Lead event of 2005 is enclosed. Participating laboratories are identified by a confidential three-digit code number assigned by the PT program. 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.

### PT Materials

The blood-based test materials were obtained from lead-dosed goats prior to the test. On October 18th, 2005, 400-500 mL of blood were drawn from each animal into a blood bag containing 750 mg K<sub>2</sub>EDTA. The animals provided pools with lead concentrations ranging from 3 µg/dL to 38 µg/dL. Aliquots of whole blood were transferred into cryovials, and shipped to participating laboratories October 19th, 2005. PT samples for laboratories using the LeadCare<sup>®</sup> system were shipped by overnight express for delivery October 19th, 2005. Target values were established by a ≥90% consensus of 17 reference laboratories.

### 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 HCFA office, and should provide our program with the address to whom 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 John Germ, OSHA SLC Analytical Laboratory, 1781 South, 300 West, Salt Lake City, UT 84114.

### Merger of Blood Lead PT Program with Pilot Program for Trace Elements in Whole Blood

In 2006, we plan to merge the New York State Department of Health's proficiency testing (PT) program for blood lead (which has existed as a separate program for more than 30 years) with the pilot program for trace elements in whole blood (As, Cd, Hg and Pb). The proposed merger will accomplish the same objective: the assessment of clinical laboratory performance for As, Cd, Hg and Pb in whole blood. Should you have any questions, I can be reached by telephone at 518-474-5475 or at [patrick.parsons@wadsworth.org](mailto:patrick.parsons@wadsworth.org).

**The next PT event for blood lead is scheduled to be mailed March 22nd, 2006.** Please inform our laboratory staff at (518) 473-0452 if the test materials have not arrived *within five days* of the scheduled mailout date. The postmark deadline for reporting results is **April 12th, 2006**.

Thank you for your participation.

Sincerely,

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

**New York State Department of Health  
Blood Lead Test Results, 2005 Event #3  
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		PB05-11	PB05-12	PB05-13	PB05-14	PB05-15		
Target Values:		36	38	15	3	23		
103	ETAAS	38	40	16	4	24	1.05	
103	ASV-LeadCare	36	37	14	2	24	0.99	Info
104	ETAAS	37	38	16	3	23	1.02	
106	ETAAS	32	32 ↓	12	2	20	0.85	Info
107	ICP-MS	37	39	15	3	23	1.01	
107	ASV-LeadCare	38	39	16	3	27	1.08	Info
108	ETAAS	37	40	17	4	22	1.04	
109	ETAAS	36	39	14	3	23	0.99	
109	ASV-LeadCare	40	39	18	3	25	1.11	Info
109	ICP-MS	37	39	15	3	23	1.01	
110	ETAAS	38	40	16	3	24	1.05	
110	ICP-MS	36	39	15	3	23	1.01	
112	ASV-ESA 3010	33	35	12	3	21	0.89	
114	ETAAS	41 ↑	37	17	5	26	1.09	
115	ETAAS	34	40	14	3	23	0.98	
121	ETAAS	35	39	24 ↑	19 ↑	30 ↑	2.25	Info
123	ETAAS	36	34	14	5	21	0.94	
125	ETAAS	36	39	15	3	23	1.01	
126	ETAAS	34	34	14	3	18 ↓	0.89	
131	ETAAS	36	39	14	3	23	0.99	
132	ETAAS	37	39	15	3	24	1.02	
143	ETAAS	36	38	15	4	22	0.99	
144	ETAAS	39	43 ↑	16	2	24	1.08	
145	ASV-ESA 3010	33	35	14	5	22	0.93	
146	ETAAS	36	37	14	3	22	0.97	
147	ICP-MS	35	38	15	3	22	0.98	
150	ASV-LeadCare	35	34	14	2	24	0.96	
156	ICP-MS	32	33 ↓	13	3	19	0.86	
158	ETAAS	31 ↓	32 ↓	12	3	20	0.84	
159	ICP-MS	36	38	15	3	22	0.99	
160	ETAAS	36	37	16	3	22	1.00	
164	ETAAS	36	38	15	3	22	0.99	Info
164	ICP-MS	34	37	15	3	22	0.97	
166	ASV-ESA 3010	39	40	15	4	23	1.03	
168	ETAAS	40	42	16	3	25	1.09	
170	ETAAS	39	40	15	3	23	1.03	

**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, 2005 Event #3  
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		PB05-11	PB05-12	PB05-13	PB05-14	PB05-15		
Target Values:		36	38	15	3	23		
174	ETAAS	37	40	17	4	23	1.05	
179	ICP-MS	38	40	16	3	23	1.04	
181	ETAAS	31 ↓	34	13	3	20	0.87	
185	ASV-ESA 3010	37	38	14	3	24	1.00	
197	ICP-MS	38	40	16	3	23	1.04	
198	ETAAS	39	42	16	4	24	1.07	Info
199	ETAAS	35	37	15	4	22	0.98	
200	ETAAS	38	40	16	4	24	1.05	
204	ASV-ESA 3010	39	41	16	6	27	1.10	
206	ICP-MS	31 ↓	24 ↓	16	3	23	0.89	
208	ETAAS	38	42	19	4	27	1.15	
212	ASV-ESA 3010	37	38	14	2	21	0.97	
215	ETAAS	37	40	17	5	26	1.09	
221	ETAAS	39	38	15	3	23	1.02	
232	ASV-ESA 3010	36	37	14	2	22	0.97	
237	ETAAS	36	38	15	3	23	1.00	
243	ASV-ESA 3010	37	38	15	2	23	1.01	
249	ASV-ESA 3010	30 ↓	36	14	4	22	0.92	
254	ETAAS	33	38	15	4	22	0.97	
255	ETAAS	38	51 ↑	20 ↑	4	32 ↑	1.28	
261	ASV-ESA 3010	32	35	13	6	23	0.92	
269	ETAAS	35	40	15	3	23	1.01	
270	ETAAS	35	35	14	3	21	0.93	
271	ASV-ESA 3010	36	37	13	2	23	0.96	
272	ETAAS	38	41	17	4	23	1.07	
274	ETAAS	36	40	15	2	22	1.00	
279	ETAAS	29 ↓	32 ↓	10 ↓	5	18 ↓	0.81	
282	ASV-ESA 3010	32	34	12	3	20	0.86	
286	ASV-ESA 3010	38	41	14	3	23	1.02	
290	ICP-MS	31 ↓	34	13	3	20	0.87	
291	ASV-ESA 3010	36	36	13	3	23	0.95	
293	ETAAS	35	36	14	2	22	0.95	
295	ASV-ESA 3010	34	31 ↓	13	2	20	0.87	
300	ASV-ESA 3010	36	38	13	<3	22	0.96	
301	ETAAS	36	40	16	3	23	1.03	
305	ETAAS	46 ↑	35	15	3	21	1.03	

**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, 2005 Event #3  
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		PB05-11	PB05-12	PB05-13	PB05-14	PB05-15		
Target Values:		36	38	15	3	23		
308	ASV-ESA 3010	37	39	13	2	22	0.97	
309	ETAAS	30 ↓	33 ↓	13	3	18 ↓	0.84	
310	ASV-ESA 3010	36	40	14	3	22	0.99	
312	ICP-MS	37	40	16	3	24	1.05	
314	ICP-MS	31 ↓	33 ↓	12	3	20	0.85	
317	ETAAS	31 ↓	33 ↓	13	3	20	0.87	
324	ICP-MS	36	38	15	3	23	1.00	
325	ETAAS	36	38	15	3	22	0.99	
333	ETAAS	38	40	15	3	23	1.03	
340	ETAAS	38	39	15	3	22	1.01	
343	ASV-LeadCare	40	38	19	3	24	1.11	Info
345	ASV-LeadCare	40	36	14	1	26	1.03	
347	ETAAS	37	39	15	2	23	1.01	Info
348	ETAAS	36	38	15	3	23	1.00	
349	ETAAS	37	41	15	3	24	1.04	
350	ASV-ESA 3010	40	41	17	9 ↑	24	1.09	
351	ETAAS	39	41	16	4	24	1.07	
352	ASV-ESA 3010	37	40	17	6	24	1.06	
353	ETAAS	35	37	13	<2	21	0.93	
359	ICP-MS	346 ↑	386 ↑	148 ↑	34 ↑	227 ↑	10.17	
365	ASV-ESA 3010	41 ↑	40	17	5	27	1.12	
367	ETAAS	39	41	16	3	25	1.08	Info
368	ASV-ESA 3010	36	39	13	3	21	0.95	
369	ASV-LeadCare	38	35	14	2	23	0.98	
370	ASV-LeadCare	39	36	14	3	24	1.00	
374	ASV-ESA 3010	40	44 ↑	16	6	26	1.12	
375	ASV-LeadCare	31 ↓	32 ↓	12	3	21	0.85	
376	ASV-ESA 3010	39	51 ↑	17	4	23	1.14	
377	ICP-MS	33	34	13	3	20	0.89	
378	ASV-ESA 3010	33	36	11	<1	20	0.87	
401	ETAAS	38	41	17	4	24	1.08	Info
408	ICP-MS	35	37	14	3	22	0.96	Info

Percent satisfactory results for all participants: 91.9 %

**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, 2005 Event #3  
STATISTICAL SUMMARY**

**TARGET VALUE ASSIGNMENT AND STATISTICS**

Lab Code	Method	Results ( $\mu\text{g/dL}$ whole blood)				
		PB05-11	PB05-12	PB05-13	PB05-14	PB05-15
103	ETAAS	38	40	16	4	24
104	ETAAS	37	38	16	3	23
107	ICP-MS	37	39	15	3	23
109	ETAAS	36	39	14	3	23
109	ICP-MS	37	39	15	3	23
110	ETAAS	38	40	16	3	24
110	ICP-MS	36	39	15	3	23
147	ICP-MS	35	38	15	3	22
164	ICP-MS	34	37	15	3	22
179	ICP-MS	38	40	16	3	23
199	ETAAS	35	37	15	4	22
200	ETAAS	38	40	16	4	24
212	ASV-ESA 3010	37	38	14	2	21
243	ASV-ESA 3010	37	38	15	2	23
293	ETAAS	35	36	14	2	22
324	ICP-MS	36	38	15	3	23
325	ETAAS	36	38	15	3	22
Number of Sample Measurements:		17	17	17	17	17
<b>Mean (target value):</b>		<b>36</b>	<b>38</b>	<b>15</b>	<b>3</b>	<b>23</b>
Standard Deviation:		1.2	1.2	0.7	0.6	0.8
RSD (%):		3.4	3.1	4.6	20.4	3.7
Acceptable Range:						
Upper Limit:		40	42	19	7	27
Lower Limit:		32	34	11	0	19

**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, 2005 Event #3  
STATISTICAL SUMMARY BY METHOD**

	Results ( $\mu\text{g/dL}$ whole blood)				
	PB05-11	PB05-12	PB05-13	PB05-14	PB05-15
<b>ASV-ESA 3010</b>					
Number of Sample Measurements:	25	25	25	18	25
Mean:	36.2	38.4	14.2	3.1	22.7
Standard Deviation:	2.8	3.8	1.7	1.0	1.9
RSD (%):	7.8	10.0	12.0	32.7	8.4
<b>ASV-LeadCare</b>					
Number of Sample Measurements:	9	9	9	9	9
Mean:	37.4	36.2	15.0	2.4	24.2
Standard Deviation:	3.0	2.3	2.2	0.7	1.7
RSD (%):	8.0	6.4	14.9	29.7	7.1
<b>ETAAS</b>					
Number of Sample Measurements:	53	53	53	51	53
Mean:	36.3	38.4	15.3	3.3	22.9
Standard Deviation:	2.9	3.3	2.1	0.8	2.5
RSD (%):	7.9	8.6	13.5	23.0	10.8
<b>ICP-MS</b>					
Number of Sample Measurements:	16	16	16	16	16
Mean:	34.8	36.4	14.6	3.0	22.0
Standard Deviation:	2.5	4.1	1.3	0.0	1.5
RSD (%):	7.2	11.3	8.6	0.0	6.6
<b>All Laboratories</b>					
Number of Sample Measurements:	103	103	103	94	103
Mean:	36.1	37.9	14.9	3.1	22.8
Standard Deviation:	2.9	3.6	1.9	0.8	2.2
RSD (%):	7.9	9.4	12.9	24.9	9.6

**notes:** ? Insufficient data for SD calculation.

**New York State Department of Health  
Blood Lead Test Results, 2005 Event #3  
STATISTICAL SUMMARY BY CLASS**

	Results ( $\mu\text{g/dL}$ whole blood)				
	PB05-11	PB05-12	PB05-13	PB05-14	PB05-15
<b>Evaluated</b>					
Number of Sample Measurements:	74	74	74	66	74
Mean:	35.9	37.7	14.6	3.2	22.6
Standard Deviation:	3.2	4.0	1.8	0.8	2.3
RSD (%):	8.8	10.7	12.2	25.9	10.1
<b>Info</b>					
Number of Sample Measurements:	12	12	12	11	12
Mean:	37.1	38.5	16.3	2.9	24.2
Standard Deviation:	2.4	2.6	3.1	0.7	2.6
RSD (%):	6.4	6.7	18.7	24.1	10.6
<b>Reference</b>					
Number of Sample Measurements:	17	17	17	17	17
Mean:	36.5	38.5	15.1	3.0	22.8
Standard Deviation:	1.2	1.2	0.7	0.6	0.8
RSD (%):	3.4	3.1	4.6	20.4	3.7
<b>All Laboratories</b>					
Number of Sample Measurements:	103	103	103	94	103
Mean:	36.1	37.9	14.9	3.1	22.8
Standard Deviation:	2.9	3.6	1.9	0.8	2.2
RSD (%):	7.9	9.4	12.9	24.9	9.6

**notes:** ? Insufficient data for SD calculation.

New York State Department of Health  
Blood Lead Test Results, 2005 Event #3

**METHOD NOTES**

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**ASV-ESA 3010**

Anodic stripping voltammetry using the ESA 3010A or 3010B instrumentation without digestion.

**ASV-LeadCare®**

Anodic stripping voltammetry using the ESA LeadCare® system.

**ETAAS**

Electrothermal atomic absorption spectrometry.

**ICP-MS**

Inductively-coupled plasma mass spectrometry (standard mode).

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