

Statistical Summary

Blood pH and Gas/Chemistry Educational Proficiency Testing November 28, 2011

Attached is a summary of participant performance (mean and standard deviation) for the Blood pH and Gas/Chemistry educational proficiency survey shipped November 28, 2011. Test specimens were commercially prepared and contained carbon dioxide and oxygen balanced with nitrogen in a physiologically buffered matrix. Five specimens (**G06, G07, G08, G09, G10**) were distributed to each participant laboratory for analysis.

Outlined below is a description of the process utilized in the evaluation of your laboratory's test results.

Target Values: Target values were derived from all-participant mean values calculated by a robust statistical technique. No peer group specific target values were utilized.

Acceptable Ranges: Allowable limits were calculated using the criteria listed below. Although analyte scores were not assigned, results noted as outside expected limits should be reviewed for potential sources of error.

Analyte	Criteria
Glucose	± 10 % or ± 6 mg/dL (whichever greater)
Sodium	± 4 mmol/L
Potassium	± 0.5 mmol/L
Chloride	± 5 %
Calcium, ionized	± 0.25 mmol/L
Magnesium, ionized	± 25 %
Lactate	± 15 % or ± 0.4 mmol/L (whichever greater)

The attached statistical report provides a summary of participant data for the five survey specimens. Results for individual instrument systems where the number of laboratories using those systems is three or greater are provided. Only one (1) laboratory reported results for ionized magnesium, therefore, results for that analyte are not included in the statistical summary. Mean and Standard Deviation (1 SD) values shown are calculated by a robust statistical technique that does not assume a Gaussian distribution.

Note: The use of brand and/or trade names in this report does not constitute an endorsement of the products on the part of the Wadsworth Center or the New York State Department of Health.

Should you have any questions or comments regarding this proficiency survey, please contact the Clinical Chemistry Section at (518) 474-5582 or by e-mail: clinchem@wadsworth.org

Summary of Participant Performance (Mean and Standard Deviation)

Glucose (mg/dL)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code]	Instrument or Reagent System
50.7 ± 2.96	86.9 ± 4.54	225.2 ± 7.54	327.0 ± 10.24	157.7 ± 6.06	n = 63	[]	All Instruments
50.6 ± 1.69	87.2 ± 1.89	226.7 ± 3.66	333.5 ± 4.76	161.3 ± 2.96	n = 5	[BYS]	Siemens Rapid Point 405
52.0 ± 0.75	86.8 ± 1.27	218.8 ± 2.58	315.2 ± 1.96	154.0 ± 2.45	n = 4	[BYT]	Siemens RapidLab 1200 Series
50.0 ± 0.00	84.4 ± 1.09	223.6 ± 1.52	328.4 ± 5.60	155.0 ± 0.93	n = 5	[IAA]	i-STAT
45.8 ± 1.88	77.7 ± 3.90	224.4 ± 11.59	326.0 ± 12.12	152.3 ± 5.22	n = 6	[MAA]	IL Gem Premier 3000
47.5 ± 1.22	80.0 ± 4.01	217.4 ± 7.26	323.5 ± 8.81	148.6 ± 3.55	n = 4	[MAC]	IL Gem Premier 4000
45.9 ± 4.38	79.4 ± 11.12	207.9 ± 18.46	310.2 ± 37.04	140.9 ± 18.37	n = 3	[MAD]	IL Gem Premier 3500
55.2 ± 1.77	94.4 ± 4.50	240.7 ± 5.64	346.3 ± 15.08	163.5 ± 8.35	n = 7	[NOG]	NOVA Critical Care Xpress
51.0 ± 0.00	87.2 ± 1.54	223.0 ± 0.90	322.0 ± 1.80	157.3 ± 0.51	n = 3	[RAN]	Radiometer ABL700 series
51.2 ± 1.63	88.5 ± 1.61	226.7 ± 3.34	325.5 ± 5.36	160.9 ± 3.51	n = 22	[RAP]	Radiometer ABL800 series

Sodium (mmol/L)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code]	Instrument or Reagent System
152.2 ± 1.81	110.3 ± 1.64	133.1 ± 2.17	137.2 ± 2.22	119.8 ± 2.14	n = 79	[]	All Instruments
151.5 ± 1.39	107.0 ± 0.04	130.3 ± 0.80	134.6 ± 0.85	116.0 ± 0.00	n = 7	[BYS]	Siemens Rapid Point 405
149.5 ± 0.90	109.4 ± 0.80	130.0 ± 0.00	133.8 ± 0.73	117.3 ± 0.73	n = 6	[BYT]	Siemens RapidLab 1200 Series
154.3 ± 0.90	111.0 ± 0.00	135.8 ± 0.41	139.5 ± 0.90	122.3 ± 0.69	n = 8	[IAA]	i-STAT
154.0 ± 0.82	109.4 ± 0.56	134.0 ± 1.42	139.0 ± 1.42	120.0 ± 0.82	n = 7	[MAA]	IL Gem Premier 3000
150.8 ± 0.66	111.2 ± 0.66	133.8 ± 0.66	138.0 ± 0.47	121.0 ± 0.00	n = 7	[MAC]	IL Gem Premier 4000
153.7 ± 0.51	109.3 ± 0.51	134.7 ± 0.51	139.0 ± 0.00	120.3 ± 0.51	n = 3	[MAD]	IL Gem Premier 3500
150.7 ± 2.39	110.3 ± 0.74	131.0 ± 0.82	134.8 ± 0.66	118.2 ± 0.92	n = 7	[NOG]	NOVA Critical Care Xpress
152.5 ± 0.57	111.1 ± 1.13	134.0 ± 0.75	138.0 ± 0.75	121.0 ± 0.75	n = 4	[RAN]	Radiometer ABL700 series
152.2 ± 1.04	110.9 ± 1.14	133.3 ± 0.87	137.1 ± 0.83	120.0 ± 1.03	n = 23	[RAP]	Radiometer ABL800 series

Potassium (mmol/L)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code]	Instrument or Reagent System
6.67 ± 0.13	7.44 ± 0.12	4.24 ± 0.09	4.81 ± 0.08	2.54 ± 0.09	n = 74	[]	All Instruments
6.70 ± 0.00	7.44 ± 0.05	4.21 ± 0.02	4.80 ± 0.01	2.50 ± 0.00	n = 8	[BYS]	Siemens Rapid Point 405
6.76 ± 0.12	7.59 ± 0.06	4.20 ± 0.00	4.80 ± 0.00	2.42 ± 0.07	n = 6	[BYT]	Siemens RapidLab 1200 Series
6.61 ± 0.06	7.28 ± 0.04	4.22 ± 0.04	4.80 ± 0.00	2.55 ± 0.06	n = 8	[IAA]	i-STAT
6.56 ± 0.06	7.38 ± 0.05	4.10 ± 0.00	4.72 ± 0.05	2.40 ± 0.00	n = 8	[MAA]	IL Gem Premier 3000
6.47 ± 0.05	7.44 ± 0.10	4.16 ± 0.10	4.70 ± 0.00	2.43 ± 0.05	n = 3	[MAD]	IL Gem Premier 3500
7.00 ± 0.00	7.85 ± 0.12	4.32 ± 0.05	4.93 ± 0.12	2.60 ± 0.00	n = 7	[NOG]	NOVA Critical Care Xpress
6.70 ± 0.00	7.45 ± 0.06	4.30 ± 0.00	4.88 ± 0.04	2.62 ± 0.04	n = 4	[RAN]	Radiometer ABL700 series
6.67 ± 0.08	7.45 ± 0.06	4.29 ± 0.04	4.84 ± 0.05	2.60 ± 0.00	n = 23	[RAP]	Radiometer ABL800 series

Summary of Participant Performance (Mean and Standard Deviation)

Chloride (mmol/L)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code] Instrument or Reagent System
116.0 ± 3.29	73.3 ± 2.24	97.4 ± 2.75	102.5 ± 2.78	82.8 ± 2.69	n = 50	[] All Instruments
117.7 ± 2.19	73.4 ± 0.55	99.0 ± 0.00	103.6 ± 0.55	83.6 ± 0.55	n = 6	[BYS] Siemens Rapid Point 405
110.5 ± 0.57	72.7 ± 0.90	92.7 ± 0.90	97.8 ± 1.27	78.7 ± 0.90	n = 4	[IAA] i-STAT
120.2 ± 0.41	75.2 ± 0.41	99.8 ± 0.41	105.2 ± 0.41	85.2 ± 0.41	n = 4	[MAC] IL Gem Premier 4000
120.1 ± 1.22	77.5 ± 2.63	101.6 ± 1.30	106.5 ± 1.14	87.2 ± 2.00	n = 7	[NOG] NOVA Critical Care Xpress
114.7 ± 0.51	71.3 ± 0.51	96.0 ± 0.00	101.0 ± 0.00	81.3 ± 0.51	n = 3	[RAN] Radiometer ABL700 series
114.3 ± 0.61	72.1 ± 0.79	96.2 ± 0.53	101.2 ± 0.65	81.8 ± 0.53	n = 18	[RAP] Radiometer ABL800 series

Calcium, ionized (mmol/L)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code] Instrument or Reagent System
0.645 ± 0.079	1.604 ± 0.058	1.346 ± 0.044	0.860 ± 0.053	1.136 ± 0.037	n = 77	[] All Instruments
0.599 ± 0.033	1.591 ± 0.011	1.320 ± 0.000	0.816 ± 0.019	1.122 ± 0.015	n = 8	[BYS] Siemens Rapid Point 405
0.650 ± 0.049	1.507 ± 0.016	1.273 ± 0.021	0.856 ± 0.041	1.099 ± 0.014	n = 10	[BYT] Siemens RapidLab 1200 Series
0.581 ± 0.011	1.523 ± 0.016	1.322 ± 0.013	0.802 ± 0.004	1.102 ± 0.004	n = 4	[IAA] i-STAT
0.580 ± 0.005	1.638 ± 0.008	1.363 ± 0.016	0.826 ± 0.021	1.138 ± 0.014	n = 7	[MAA] IL Gem Premier 3000
0.568 ± 0.009	1.650 ± 0.022	1.363 ± 0.005	0.826 ± 0.006	1.150 ± 0.008	n = 7	[MAC] IL Gem Premier 4000
0.567 ± 0.005	1.632 ± 0.015	1.369 ± 0.020	0.832 ± 0.041	1.130 ± 0.009	n = 3	[MAD] IL Gem Premier 3500
0.628 ± 0.038	1.581 ± 0.070	1.329 ± 0.045	0.841 ± 0.021	1.105 ± 0.026	n = 6	[NOG] NOVA Critical Care Xpress
0.730 ± 0.027	1.627 ± 0.014	1.374 ± 0.020	0.922 ± 0.023	1.175 ± 0.023	n = 5	[RAN] Radiometer ABL700 series
0.726 ± 0.034	1.632 ± 0.028	1.369 ± 0.017	0.918 ± 0.025	1.171 ± 0.019	n = 22	[RAP] Radiometer ABL800 series

Lactate (mmol/L)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code] Instrument or Reagent System
1.88 ± 0.11	3.70 ± 0.19	6.41 ± 0.32	9.55 ± 0.47	5.49 ± 0.28	n = 39	[] All Instruments
2.00 ± 0.09	3.80 ± 0.09	6.38 ± 0.15	9.57 ± 0.14	5.29 ± 0.37	n = 3	[BYT] Siemens RapidLab 1200 Series
1.88 ± 0.16	3.73 ± 0.24	6.59 ± 0.55	9.85 ± 0.79	5.53 ± 0.38	n = 6	[MAA] IL Gem Premier 3000
1.77 ± 0.05	3.40 ± 0.09	5.74 ± 0.10	8.50 ± 0.09	4.90 ± 0.09	n = 3	[MAC] IL Gem Premier 4000
1.86 ± 0.26	3.75 ± 0.19	6.47 ± 0.42	9.85 ± 0.54	5.57 ± 0.34	n = 3	[MAD] IL Gem Premier 3500
1.97 ± 0.05	3.90 ± 0.09	6.67 ± 0.23	9.70 ± 0.45	5.67 ± 0.14	n = 3	[NOG] NOVA Critical Care Xpress
1.86 ± 0.07	3.71 ± 0.12	6.44 ± 0.18	9.61 ± 0.26	5.56 ± 0.14	n = 18	[RAP] Radiometer ABL800 series

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Executive Deputy Commissioner

Statistical Summary

Blood pH and Gases Proficiency Testing

November 28, 2011

Attached is a summary of participant performance (mean and standard deviation) for Blood pH and Gases for the November 28, 2011 proficiency test event. Test specimens were commercially prepared and contained carbon dioxide and oxygen balanced with nitrogen in a physiologically buffered matrix. Five specimens (G06, G07, G08, G09, G10) were distributed to each participant laboratory for analysis.

Results for individual instrument systems where the number of laboratories using those systems is three or greater are provided. Mean and Standard Deviation (1 SD) values shown are calculated by a robust statistical technique that does not assume a Gaussian distribution. These statistical reports are also available on the internet at:
<http://www.wadsworth.org/chemheme/chem/bg/bgframes.htm>

Should you have any questions regarding these reports or wish to obtain an additional copy, please contact the Clinical Chemistry Section at (518) 474-5582.

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Summary of Participant Performance (Mean and Standard Deviation)

pH

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code] Instrument or Reagent System
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7.616 ± 0.029	7.132 ± 0.023	7.426 ± 0.017	7.585 ± 0.025	7.257 ± 0.016	n = 220	[] All Instruments
7.614 ± 0.020	7.151 ± 0.016	7.424 ± 0.011	7.584 ± 0.011	7.266 ± 0.009	n = 5	[AVQ] Opti Medical OPTI CCA
7.613 ± 0.007	7.108 ± 0.006	7.425 ± 0.006	7.588 ± 0.007	7.248 ± 0.008	n = 34	[BYS] Siemens Rapid Point 405
7.634 ± 0.007	7.155 ± 0.007	7.446 ± 0.008	7.608 ± 0.010	7.279 ± 0.009	n = 17	[BYT] Siemens RapidLab 1200 Series
7.628 ± 0.008	7.155 ± 0.003	7.439 ± 0.000	7.592 ± 0.002	7.282 ± 0.004	n = 3	[COA] Siemens RapidLab 845
7.675 ± 0.006	7.172 ± 0.005	7.456 ± 0.007	7.637 ± 0.005	7.288 ± 0.004	n = 17	[IAA] i-STAT
7.649 ± 0.007	7.114 ± 0.006	7.439 ± 0.006	7.604 ± 0.009	7.257 ± 0.007	n = 20	[MAA] IL Gem Premier 3000
7.630 ± 0.000	7.107 ± 0.005	7.424 ± 0.006	7.586 ± 0.006	7.249 ± 0.006	n = 14	[MAC] IL Gem Premier 4000
7.652 ± 0.007	7.121 ± 0.011	7.443 ± 0.007	7.612 ± 0.005	7.260 ± 0.008	n = 7	[MAD] IL Gem Premier 3500
7.612 ± 0.004	7.164 ± 0.006	7.441 ± 0.003	7.582 ± 0.005	7.283 ± 0.007	n = 8	[NOG] NOVA Critical Care Xpress
7.581 ± 0.009	7.141 ± 0.005	7.409 ± 0.010	7.554 ± 0.011	7.251 ± 0.005	n = 15	[RAX] Radiometer ABL 80 Flex
7.623 ± 0.008	7.127 ± 0.009	7.423 ± 0.009	7.588 ± 0.004	7.248 ± 0.004	n = 4	[RAJ] Radiometer NPT7
7.592 ± 0.003	7.132 ± 0.003	7.410 ± 0.001	7.564 ± 0.004	7.249 ± 0.003	n = 13	[RAN] Radiometer ABL700 series
7.592 ± 0.003	7.132 ± 0.003	7.411 ± 0.003	7.565 ± 0.005	7.251 ± 0.000	n = 46	[RAP] Radiometer ABL800 series
7.579 ± 0.008	7.148 ± 0.006	7.414 ± 0.009	7.544 ± 0.008	7.261 ± 0.007	n = 4	[ROW] Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Pco2 (mmHg)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code] Instrument or Reagent System
22.47 ± 0.90	71.80 ± 4.21	37.40 ± 1.57	24.60 ± 1.11	51.15 ± 2.47	n = 220	[] All Instruments
23.15 ± 1.29	72.39 ± 0.38	36.18 ± 1.94	25.36 ± 2.35	50.14 ± 0.95	n = 5	[AVQ] Opti Medical OPTI CCA
23.29 ± 1.03	76.83 ± 4.74	39.04 ± 1.41	25.13 ± 1.10	53.48 ± 2.77	n = 34	[BYS] Siemens Rapid Point 405
21.46 ± 0.82	70.50 ± 2.02	36.41 ± 1.13	22.79 ± 0.82	50.09 ± 1.86	n = 17	[BYT] Siemens RapidLab 1200 Series
22.95 ± 0.27	70.23 ± 1.69	37.69 ± 0.20	24.62 ± 0.32	50.33 ± 1.85	n = 3	[COA] Siemens RapidLab 845
21.55 ± 0.40	65.72 ± 1.21	34.11 ± 0.80	22.65 ± 0.41	47.05 ± 0.70	n = 17	[IAA] i-STAT
22.25 ± 0.56	76.50 ± 1.35	37.57 ± 1.02	24.97 ± 0.46	54.22 ± 1.15	n = 20	[MAA] IL Gem Premier 3000
21.32 ± 0.59	74.33 ± 2.92	35.76 ± 0.71	23.85 ± 0.74	50.13 ± 2.04	n = 14	[MAC] IL Gem Premier 4000
22.59 ± 0.56	76.42 ± 1.83	36.91 ± 1.23	25.33 ± 0.74	54.33 ± 1.91	n = 7	[MAD] IL Gem Premier 3500
23.02 ± 0.17	67.28 ± 1.89	37.29 ± 0.83	25.00 ± 0.11	50.00 ± 0.00	n = 8	[NOG] NOVA Critical Care Xpress
23.08 ± 0.84	72.56 ± 1.72	38.39 ± 1.09	25.17 ± 0.85	52.61 ± 1.08	n = 15	[RAX] Radiometer ABL 80 Flex
23.00 ± 0.00	70.87 ± 1.13	37.50 ± 0.57	24.31 ± 0.90	51.85 ± 0.41	n = 4	[RAJ] Radiometer NPT7
22.57 ± 0.50	69.90 ± 1.52	37.87 ± 0.29	25.00 ± 0.44	50.79 ± 0.78	n = 13	[RAN] Radiometer ABL700 series
22.54 ± 0.51	69.63 ± 1.36	37.54 ± 0.65	24.88 ± 0.47	50.46 ± 0.87	n = 46	[RAP] Radiometer ABL800 series
23.16 ± 0.43	74.27 ± 1.01	38.88 ± 0.31	25.46 ± 0.38	52.95 ± 0.98	n = 4	[ROW] Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Po2 (mmHg)

Specimen: G06	Specimen: G07	Specimen: G08	Specimen: G09	Specimen: G10	Number	[Code]	Instrument or Reagent System
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126.24 ± 5.55	160.74 ± 6.79	91.75 ± 6.33	73.93 ± 7.36	140.56 ± 5.62	n = 220	[]	All Instruments
123.38 ± 4.38	160.62 ± 7.64	92.47 ± 1.05	80.19 ± 4.09	138.94 ± 7.02	n = 5	[AVQ]	Opti Medical OPTI CCA
124.00 ± 3.71	153.42 ± 4.41	92.99 ± 5.73	75.49 ± 6.00	136.36 ± 4.27	n = 34	[BYS]	Siemens Rapid Point 405
120.43 ± 2.48	159.64 ± 4.30	87.26 ± 4.48	69.04 ± 6.08	136.92 ± 4.47	n = 17	[BYT]	Siemens RapidLab 1200 Series
120.70 ± 1.64	158.83 ± 0.95	84.26 ± 4.45	63.78 ± 4.85	138.35 ± 5.91	n = 3	[COA]	Siemens RapidLab 845
125.67 ± 6.04	160.05 ± 8.41	98.35 ± 5.55	82.06 ± 3.74	140.62 ± 6.97	n = 17	[IAA]	i-STAT
129.51 ± 3.26	168.11 ± 3.53	88.19 ± 1.88	70.27 ± 1.84	145.94 ± 3.70	n = 20	[MAA]	IL Gem Premier 3000
129.78 ± 3.49	163.95 ± 4.36	91.37 ± 2.19	73.61 ± 3.04	143.04 ± 2.95	n = 14	[MAC]	IL Gem Premier 4000
129.04 ± 2.37	165.48 ± 5.13	89.20 ± 3.44	69.78 ± 1.80	144.35 ± 3.82	n = 7	[MAD]	IL Gem Premier 3500
127.34 ± 6.24	168.32 ± 10.15	87.69 ± 3.95	66.98 ± 4.04	143.47 ± 4.86	n = 8	[NOG]	NOVA Critical Care Xpress
117.32 ± 6.18	158.24 ± 5.79	80.38 ± 5.39	61.69 ± 6.46	135.37 ± 4.65	n = 15	[RAX]	Radiometer ABL 80 Flex
126.78 ± 2.68	163.70 ± 3.17	83.15 ± 3.52	64.07 ± 2.72	140.10 ± 3.69	n = 4	[RAJ]	Radiometer NPT7
127.46 ± 2.41	159.89 ± 3.96	91.75 ± 1.43	73.87 ± 2.12	140.57 ± 2.15	n = 13	[RAN]	Radiometer ABL700 series
128.88 ± 2.85	161.15 ± 3.77	95.24 ± 2.05	77.60 ± 2.39	141.60 ± 3.19	n = 46	[RAP]	Radiometer ABL800 series
131.36 ± 2.42	168.16 ± 5.22	106.88 ± 1.88	91.84 ± 1.20	151.22 ± 3.65	n = 4	[ROW]	Roche OMNI/Cobas series