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Blood pH and Gases Proficiency Test Program

Statistical Summary – March 2015 (Event 15-1)

This statistical report summarizes participant data for the five Blood pH and Gas/Chemistry proficiency survey specimens shipped March 9, 2015. Test specimens were commercially prepared and contained carbon dioxide and oxygen balanced with nitrogen in a physiologically buffered matrix. Five specimens (G56, G57, G58, G59, G60) 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 are calculated by a robust statistical technique that does not assume a Gaussian distribution.

Disclaimer:

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 regarding this report, please contact the Clinical Chemistry Section at (518) 474-5582.

Summary of Participant Performance (Mean and Standard Deviation)

pH

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
7.245 ± 0.016	7.142 ± 0.023	7.581 ± 0.024	7.437 ± 0.017	7.500 ± 0.024	n = 223	[ ]	All Instruments
7.243 ± 0.019	7.150 ± 0.009	7.578 ± 0.010	7.440 ± 0.000	7.493 ± 0.008	n = 6	[AVQ]	Opti Medical OPTI CCA
7.232 ± 0.008	7.118 ± 0.007	7.581 ± 0.005	7.436 ± 0.009	7.488 ± 0.006	n = 19	[BYS]	Siemens Rapid Point 405
7.235 ± 0.006	7.122 ± 0.006	7.586 ± 0.006	7.438 ± 0.006	7.489 ± 0.005	n = 14	[BYQ]	Siemens Rapid Point 500
7.269 ± 0.006	7.167 ± 0.007	7.604 ± 0.006	7.458 ± 0.007	7.515 ± 0.007	n = 17	[BYT]	Siemens RapidLab 1200 Series
7.192 ± 0.010	7.099 ± 0.004	7.571 ± 0.004	7.409 ± 0.003	7.515 ± 0.002	n = 3	[EPO]	Epocal epoc
7.272 ± 0.005	7.177 ± 0.005	7.630 ± 0.006	7.462 ± 0.004	7.549 ± 0.006	n = 25	[IAA]	i-STAT
7.240 ± 0.000	7.125 ± 0.007	7.606 ± 0.009	7.451 ± 0.006	7.520 ± 0.000	n = 13	[MAA]	IL Gem Premier 3000
7.232 ± 0.005	7.112 ± 0.005	7.574 ± 0.008	7.434 ± 0.007	7.496 ± 0.007	n = 20	[MAC]	IL Gem Premier 4000
7.246 ± 0.006	7.123 ± 0.005	7.604 ± 0.008	7.449 ± 0.004	7.520 ± 0.000	n = 11	[MAD]	IL Gem Premier 3500
7.265 ± 0.004	7.170 ± 0.005	7.572 ± 0.005	7.442 ± 0.005	7.498 ± 0.000	n = 3	[NOW]	NOVA pHOX Ultra
7.251 ± 0.009	7.154 ± 0.008	7.569 ± 0.011	7.428 ± 0.008	7.515 ± 0.009	n = 18	[RAX]	Radiometer ABL 80 Flex
7.242 ± 0.006	7.142 ± 0.005	7.576 ± 0.004	7.433 ± 0.004	7.491 ± 0.002	n = 6	[RAY]	Radiometer ABL 90 Flex
7.239 ± 0.004	7.143 ± 0.005	7.562 ± 0.004	7.422 ± 0.004	7.479 ± 0.003	n = 54	[RAP]	Radiometer ABL800 series
7.254 ± 0.004	7.151 ± 0.001	7.547 ± 0.006	7.422 ± 0.010	7.476 ± 0.005	n = 6	[ROW]	Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Pco2 (mmHg)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
52.32 ± 2.45	67.76 ± 3.91	24.23 ± 1.36	35.74 ± 1.62	31.33 ± 1.17	n = 223	[ ]	All Instruments
52.21 ± 0.46	67.80 ± 1.76	26.00 ± 0.40	34.97 ± 1.71	31.71 ± 0.79	n = 6	[AVQ]	Opti Medical OPTI CCA
56.53 ± 2.24	74.43 ± 3.43	24.74 ± 0.87	37.21 ± 1.38	32.52 ± 0.92	n = 19	[BYS]	Siemens Rapid Point 405
55.57 ± 2.68	72.13 ± 2.89	24.74 ± 0.50	36.32 ± 1.30	32.21 ± 0.82	n = 14	[BYQ]	Siemens Rapid Point 500
52.21 ± 0.98	68.30 ± 1.77	22.45 ± 0.79	34.12 ± 1.02	29.76 ± 1.02	n = 17	[BYT]	Siemens RapidLab 1200 Series
54.37 ± 1.58	65.24 ± 6.03	22.40 ± 0.36	34.50 ± 0.36	27.74 ± 0.26	n = 3	[EPO]	Epocal epoc
48.92 ± 1.17	62.71 ± 1.21	22.92 ± 0.48	33.22 ± 0.80	30.47 ± 0.65	n = 25	[IAA]	i-STAT
54.41 ± 1.27	70.81 ± 2.42	23.58 ± 0.66	37.39 ± 0.56	31.68 ± 0.63	n = 13	[MAA]	IL Gem Premier 3000
51.11 ± 0.89	68.38 ± 1.03	23.00 ± 0.00	34.67 ± 1.10	30.60 ± 0.66	n = 20	[MAC]	IL Gem Premier 4000
54.42 ± 1.17	71.25 ± 1.42	24.00 ± 0.00	37.21 ± 0.76	31.83 ± 0.57	n = 11	[MAD]	IL Gem Premier 3500
52.37 ± 1.42	64.66 ± 2.41	26.05 ± 0.19	36.73 ± 0.23	32.76 ± 0.62	n = 3	[NOW]	NOVA pHOX Ultra
52.85 ± 1.33	69.79 ± 2.69	23.58 ± 0.86	35.87 ± 0.80	31.03 ± 1.13	n = 18	[RAX]	Radiometer ABL 80 Flex
51.50 ± 1.09	65.21 ± 0.95	24.88 ± 0.32	35.87 ± 0.39	31.67 ± 0.36	n = 6	[RAY]	Radiometer ABL 90 Flex
51.67 ± 1.13	65.55 ± 1.46	25.36 ± 0.61	36.08 ± 0.60	31.44 ± 0.59	n = 54	[RAP]	Radiometer ABL800 series
54.51 ± 1.01	71.10 ± 1.20	25.96 ± 0.61	37.54 ± 0.84	33.76 ± 0.63	n = 6	[ROW]	Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Po2 (mmHg)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
138.35 ± 5.40	163.53 ± 5.85	73.90 ± 8.66	90.12 ± 6.84	201.67 ± 8.34	n = 223	[ ]	All Instruments
136.26 ± 4.18	161.53 ± 2.33	78.43 ± 3.06	91.45 ± 3.24	196.49 ± 6.92	n = 6	[AVQ]	Opti Medical OPTI CCA
137.57 ± 3.47	161.37 ± 4.04	72.07 ± 2.51	91.02 ± 3.53	204.07 ± 4.96	n = 19	[BYS]	Siemens Rapid Point 405
134.18 ± 2.60	156.76 ± 4.28	72.76 ± 5.46	88.93 ± 4.58	197.84 ± 3.73	n = 14	[BYQ]	Siemens Rapid Point 500
133.80 ± 5.92	164.59 ± 4.90	65.49 ± 4.56	83.13 ± 3.93	206.69 ± 6.60	n = 17	[BYT]	Siemens RapidLab 1200 Series
138.86 ± 1.18	173.72 ± 6.36	65.46 ± 5.50	85.68 ± 4.40	213.18 ± 5.99	n = 3	[EPO]	Epocal epoc
138.15 ± 4.08	160.28 ± 5.46	83.04 ± 3.25	97.27 ± 4.35	188.07 ± 7.16	n = 25	[IAA]	i-STAT
143.33 ± 2.95	170.90 ± 4.92	70.86 ± 1.74	88.21 ± 1.86	209.50 ± 5.70	n = 13	[MAA]	IL Gem Premier 3000
138.57 ± 4.08	164.13 ± 3.70	74.06 ± 3.69	89.98 ± 4.36	200.07 ± 4.16	n = 20	[MAC]	IL Gem Premier 4000
144.94 ± 2.30	172.23 ± 3.46	70.53 ± 1.50	87.81 ± 1.96	210.32 ± 4.55	n = 11	[MAD]	IL Gem Premier 3500
139.22 ± 3.67	169.52 ± 3.86	63.35 ± 2.16	83.62 ± 1.84	213.05 ± 3.72	n = 3	[NOW]	NOVA pHOX Ultra
130.65 ± 7.02	159.09 ± 5.67	57.64 ± 3.56	77.92 ± 3.98	199.71 ± 7.94	n = 18	[RAX]	Radiometer ABL 80 Flex
134.26 ± 2.67	164.61 ± 2.47	54.62 ± 0.70	76.15 ± 1.97	206.46 ± 3.63	n = 6	[RAY]	Radiometer ABL 90 Flex
139.14 ± 2.57	163.39 ± 3.74	76.91 ± 2.01	92.92 ± 1.94	201.11 ± 5.51	n = 54	[RAP]	Radiometer ABL800 series
149.92 ± 1.49	171.16 ± 2.03	92.46 ± 2.71	106.76 ± 1.50	207.12 ± 1.10	n = 6	[ROW]	Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Glucose (mg/dL)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
156.9 ± 7.07	87.0 ± 5.34	324.6 ± 9.07	224.5 ± 7.71	257.9 ± 7.32	n = 66	[ ]	All Instruments
159.6 ± 1.02	88.0 ± 0.90	326.0 ± 9.90	227.1 ± 6.08	260.0 ± 3.61	n = 3	[BYS]	Siemens Rapid Point 405
152.2 ± 1.89	84.8 ± 1.78	309.1 ± 4.76	216.4 ± 4.34	250.3 ± 2.77	n = 5	[BYT]	Siemens RapidLab 1200 Series
153.5 ± 1.30	83.9 ± 1.49	326.1 ± 3.39	221.4 ± 2.47	257.6 ± 2.58	n = 9	[IAA]	i-STAT
145.8 ± 9.04	76.0 ± 4.99	321.5 ± 7.69	221.1 ± 4.44	251.8 ± 6.79	n = 4	[MAA]	IL Gem Premier 3000
146.2 ± 0.80	78.3 ± 1.61	318.9 ± 4.34	214.0 ± 2.12	250.6 ± 2.47	n = 5	[MAC]	IL Gem Premier 4000
163.7 ± 5.09	91.0 ± 2.70	328.6 ± 18.94	230.6 ± 6.23	266.5 ± 9.09	n = 3	[NOW]	NOVA pHOX Ultra
160.3 ± 3.56	90.1 ± 2.57	326.7 ± 6.78	228.3 ± 5.56	261.2 ± 5.98	n = 27	[RAP]	Radiometer ABL800 series

Sodium (mmol/L)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
119.3 ± 1.93	109.8 ± 1.31	136.5 ± 2.33	132.6 ± 2.15	121.7 ± 1.17	n = 83	[ ]	All Instruments
115.5 ± 0.57	106.2 ± 0.41	133.3 ± 0.90	129.7 ± 0.82	119.0 ± 0.75	n = 4	[BYS]	Siemens Rapid Point 405
116.0 ± 0.00	106.7 ± 0.51	133.7 ± 0.51	129.7 ± 0.51	119.0 ± 0.00	n = 3	[BYQ]	Siemens Rapid Point 500
117.0 ± 0.00	109.4 ± 2.22	133.0 ± 0.00	129.6 ± 0.56	121.0 ± 0.00	n = 7	[BYT]	Siemens RapidLab 1200 Series
122.3 ± 1.16	110.4 ± 0.67	140.3 ± 0.80	136.1 ± 0.44	121.6 ± 0.57	n = 11	[IAA]	i-STAT
120.2 ± 0.41	110.2 ± 0.41	138.7 ± 0.82	134.2 ± 0.41	122.8 ± 0.41	n = 4	[MAA]	IL Gem Premier 3000
120.1 ± 0.49	110.6 ± 0.55	137.5 ± 0.69	133.5 ± 0.69	122.5 ± 0.71	n = 10	[MAC]	IL Gem Premier 4000
118.0 ± 0.00	110.0 ± 0.00	134.7 ± 0.51	131.7 ± 0.51	120.7 ± 0.51	n = 3	[NOW]	NOVA pHOX Ultra
119.0 ± 0.00	111.3 ± 3.37	137.0 ± 0.00	133.0 ± 0.00	122.3 ± 0.51	n = 3	[RAY]	Radiometer ABL 90 Flex
119.0 ± 0.60	109.4 ± 0.70	136.1 ± 0.78	132.3 ± 0.70	122.0 ± 0.66	n = 29	[RAP]	Radiometer ABL800 series

Potassium (mmol/L)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
2.53 ± 0.08	7.42 ± 0.17	4.79 ± 0.08	4.23 ± 0.06	3.41 ± 0.08	n = 85	[ ]	All Instruments
2.50 ± 0.00	7.42 ± 0.04	4.80 ± 0.00	4.20 ± 0.00	3.40 ± 0.00	n = 4	[BYS]	Siemens Rapid Point 405
2.50 ± 0.00	7.30 ± 0.00	4.80 ± 0.00	4.20 ± 0.00	3.40 ± 0.00	n = 5	[BYQ]	Siemens Rapid Point 500
2.42 ± 0.05	7.58 ± 0.13	4.74 ± 0.06	4.20 ± 0.00	3.40 ± 0.00	n = 7	[BYT]	Siemens RapidLab 1200 Series
2.50 ± 0.00	7.19 ± 0.04	4.74 ± 0.06	4.20 ± 0.00	3.30 ± 0.00	n = 11	[IAA]	i-STAT
2.40 ± 0.00	7.40 ± 0.08	4.68 ± 0.04	4.10 ± 0.00	3.30 ± 0.00	n = 4	[MAA]	IL Gem Premier 3000
2.50 ± 0.00	7.64 ± 0.05	4.87 ± 0.05	4.27 ± 0.05	3.46 ± 0.11	n = 8	[MAC]	IL Gem Premier 4000
2.60 ± 0.00	7.74 ± 0.10	4.93 ± 0.05	4.30 ± 0.00	3.50 ± 0.00	n = 3	[NOW]	NOVA pHOX Ultra
2.57 ± 0.05	7.23 ± 0.05	4.70 ± 0.00	4.20 ± 0.00	3.40 ± 0.00	n = 3	[RAY]	Radiometer ABL 90 Flex
2.58 ± 0.05	7.40 ± 0.00	4.81 ± 0.04	4.26 ± 0.06	3.47 ± 0.05	n = 29	[RAP]	Radiometer ABL800 series

Summary of Participant Performance (Mean and Standard Deviation)

Chloride (mmol/L)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
82.4 ± 3.22	72.1 ± 2.41	102.3 ± 3.00	97.0 ± 3.16	68.5 ± 3.11	n = 56	[ ]	All Instruments
83.3 ± 0.51	72.3 ± 0.51	102.6 ± 1.02	97.6 ± 1.02	67.7 ± 0.51	n = 3	[BYS]	Siemens Rapid Point 405
83.7 ± 0.51	73.7 ± 0.51	102.7 ± 0.51	98.0 ± 0.90	69.7 ± 0.51	n = 3	[BYQ]	Siemens Rapid Point 500
85.8 ± 0.41	75.3 ± 0.90	104.5 ± 0.57	99.5 ± 0.57	72.1 ± 2.04	n = 4	[BYT]	Siemens RapidLab 1200 Series
76.8 ± 0.92	70.0 ± 0.82	95.0 ± 0.00	89.8 ± 0.47	65.0 ± 0.00	n = 7	[IAA]	i-STAT
85.2 ± 0.80	75.0 ± 0.00	105.0 ± 0.64	100.0 ± 0.00	72.7 ± 1.38	n = 5	[MAC]	IL Gem Premier 4000
88.6 ± 1.02	78.5 ± 1.86	107.6 ± 1.02	102.3 ± 0.51	75.8 ± 1.54	n = 3	[NOW]	NOVA pHOX Ultra
81.6 ± 1.20	71.3 ± 1.11	101.8 ± 1.09	96.5 ± 1.09	67.7 ± 1.24	n = 23	[RAP]	Radiometer ABL800 series

Ionized Calcium (mmol/L)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
1.003 ± 0.031	1.349 ± 0.042	0.736 ± 0.045	1.125 ± 0.032	0.832 ± 0.045	n = 92	[ ]	All Instruments
0.980 ± 0.000	1.324 ± 0.008	0.703 ± 0.011	1.100 ± 0.000	0.820 ± 0.014	n = 6	[BYS]	Siemens Rapid Point 405
0.989 ± 0.011	1.320 ± 0.013	0.739 ± 0.037	1.100 ± 0.000	0.845 ± 0.027	n = 5	[BYQ]	Siemens Rapid Point 500
0.985 ± 0.013	1.290 ± 0.013	0.747 ± 0.032	1.075 ± 0.013	0.865 ± 0.023	n = 11	[BYT]	Siemens RapidLab 1200 Series
0.996 ± 0.015	1.326 ± 0.018	0.703 ± 0.007	1.135 ± 0.008	0.769 ± 0.017	n = 9	[IAA]	i-STAT
0.980 ± 0.009	1.371 ± 0.026	0.682 ± 0.004	1.131 ± 0.016	0.784 ± 0.014	n = 5	[MAA]	IL Gem Premier 3000
0.997 ± 0.014	1.372 ± 0.010	0.700 ± 0.012	1.128 ± 0.013	0.806 ± 0.012	n = 11	[MAC]	IL Gem Premier 4000
0.985 ± 0.012	1.330 ± 0.011	0.722 ± 0.004	1.100 ± 0.008	0.823 ± 0.009	n = 4	[RAY]	Radiometer ABL 90 Flex
1.039 ± 0.013	1.382 ± 0.016	0.781 ± 0.020	1.148 ± 0.017	0.868 ± 0.016	n = 28	[RAP]	Radiometer ABL800 series
0.967 ± 0.014	1.308 ± 0.032	0.690 ± 0.009	1.108 ± 0.024	0.777 ± 0.023	n = 3	[ROW]	Roche OMNI/Cobas series

Ionized Magnesium (mmol/L)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
0.935 ± 0.097	0.625 ± 0.029	1.280 ± 0.137	0.655 ± 0.051	1.065 ± 0.108	n = 2	[ ]	All Instruments

Lactate (mmol/L)

Specimen: G56	Specimen: G57	Specimen: G58	Specimen: G59	Specimen: G60	Number	[Code]	Instrument or Reagent System
5.44 ± 0.26	3.64 ± 0.18	9.12 ± 0.52	6.41 ± 0.30	8.44 ± 0.44	n = 70	[ ]	All Instruments
5.68 ± 0.32	3.74 ± 0.13	9.88 ± 0.68	6.62 ± 0.39	9.15 ± 0.46	n = 6	[BYQ]	Siemens Rapid Point 500
5.38 ± 0.25	3.63 ± 0.16	8.51 ± 0.73	6.07 ± 0.57	8.14 ± 0.36	n = 5	[BYT]	Siemens RapidLab 1200 Series
5.50 ± 0.00	3.70 ± 0.00	9.07 ± 0.11	6.40 ± 0.00	8.51 ± 0.10	n = 10	[IAA]	i-STAT
5.34 ± 0.11	3.48 ± 0.08	9.24 ± 0.06	6.47 ± 0.24	8.90 ± 0.09	n = 5	[MAA]	IL Gem Premier 3000
4.80 ± 0.06	3.30 ± 0.00	8.34 ± 0.11	5.80 ± 0.06	7.96 ± 0.06	n = 5	[MAC]	IL Gem Premier 4000
5.49 ± 0.29	3.75 ± 0.19	8.75 ± 0.72	6.41 ± 0.20	8.36 ± 0.39	n = 3	[NOW]	NOVA pHOX Ultra
5.40 ± 0.23	3.55 ± 0.17	9.51 ± 0.35	6.42 ± 0.20	8.60 ± 0.51	n = 4	[RAY]	Radiometer ABL 90 Flex
5.49 ± 0.21	3.67 ± 0.15	9.21 ± 0.43	6.47 ± 0.28	8.34 ± 0.36	n = 25	[RAP]	Radiometer ABL800 series