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Blood pH and Gases Proficiency Test Program

Statistical Summary – November 2015 (Event 15-3)

This statistical report summarizes participant data for the five Blood pH and Gas/Chemistry proficiency survey specimens shipped November 2, 2015. Test specimens were commercially prepared and contained carbon dioxide and oxygen balanced with nitrogen in a physiologically buffered matrix. Five specimens (G66, G67, G68, G69, G70) 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.

Please note that Glucose, Sodium, Potassium, Chloride, Ionized Calcium, and Lactate, included in this proficiency test event as educational challenges, will be graded beginning with the March 2016 event.

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: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
7.139 ± 0.025	7.235 ± 0.016	7.499 ± 0.026	7.571 ± 0.025	7.642 ± 0.032	n = 222	[ ] All Instruments
7.180 ± 0.006	7.268 ± 0.008	7.555 ± 0.006	7.631 ± 0.007	7.712 ± 0.009	n = 28	[IAA] Abbott i-STAT
7.073 ± 0.006	7.172 ± 0.007	7.508 ± 0.004	7.553 ± 0.006	7.634 ± 0.004	n = 3	[EPO] Epocal epoc
7.125 ± 0.008	7.237 ± 0.005	7.522 ± 0.006	7.595 ± 0.007	7.680 ± 0.008	n = 13	[MAA] IL Gem Premier 3000
7.124 ± 0.006	7.235 ± 0.008	7.520 ± 0.000	7.590 ± 0.008	7.680 ± 0.006	n = 10	[MAD] IL Gem Premier 3500
7.113 ± 0.006	7.227 ± 0.006	7.502 ± 0.006	7.574 ± 0.007	7.654 ± 0.009	n = 21	[MAC] IL Gem Premier 4000
7.148 ± 0.008	7.231 ± 0.004	7.483 ± 0.004	7.556 ± 0.007	7.638 ± 0.010	n = 4	[AVQ] Opti Medical OPTI CCA
7.147 ± 0.012	7.230 ± 0.008	7.507 ± 0.009	7.551 ± 0.009	7.613 ± 0.011	n = 18	[RAX] Radiometer ABL 80 Flex
7.137 ± 0.008	7.229 ± 0.005	7.491 ± 0.003	7.566 ± 0.006	7.630 ± 0.000	n = 10	[RAY] Radiometer ABL 90 Flex
7.139 ± 0.004	7.229 ± 0.004	7.479 ± 0.002	7.553 ± 0.004	7.619 ± 0.003	n = 53	[RAP] Radiometer ABL800 series
7.150 ± 0.006	7.240 ± 0.007	7.476 ± 0.007	7.536 ± 0.006	7.601 ± 0.002	n = 6	[ROW] Roche OMNI/Cobas series
7.110 ± 0.005	7.222 ± 0.004	7.484 ± 0.005	7.569 ± 0.005	7.632 ± 0.004	n = 15	[BYS] Siemens Rapid Point 405
7.113 ± 0.005	7.224 ± 0.006	7.485 ± 0.006	7.571 ± 0.005	7.634 ± 0.006	n = 17	[BYQ] Siemens Rapid Point 500
7.163 ± 0.007	7.257 ± 0.008	7.513 ± 0.008	7.594 ± 0.008	7.660 ± 0.007	n = 17	[BYT] Siemens RapidLab 1200 Series

Summary of Participant Performance (Mean and Standard Deviation)

Pco2 (mmHg)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
68.67 ± 4.61	53.69 ± 2.62	31.50 ± 1.18	25.15 ± 1.17	20.97 ± 1.02	n = 222	[ ] All Instruments
62.82 ± 1.39	49.73 ± 0.77	30.86 ± 0.72	23.63 ± 0.55	21.14 ± 0.47	n = 28	[IAA] Abbott i-STAT
68.98 ± 2.67	54.23 ± 0.34	27.91 ± 0.66	23.08 ± 0.41	19.42 ± 0.32	n = 3	[EPO] Epocal epoc
72.94 ± 1.38	55.58 ± 0.74	31.22 ± 0.59	25.00 ± 0.79	19.84 ± 0.69	n = 13	[MAA] IL Gem Premier 3000
72.23 ± 0.90	54.94 ± 1.13	31.33 ± 0.67	25.08 ± 0.49	20.11 ± 0.74	n = 10	[MAD] IL Gem Premier 3500
69.50 ± 1.72	53.36 ± 0.88	31.21 ± 0.53	25.00 ± 0.00	20.79 ± 0.53	n = 21	[MAC] IL Gem Premier 4000
68.79 ± 1.88	52.72 ± 1.33	30.85 ± 3.26	26.96 ± 0.98	22.70 ± 1.20	n = 4	[AVQ] Opti Medical OPTI CCA
71.93 ± 2.87	56.74 ± 2.00	31.92 ± 0.70	24.86 ± 0.64	20.68 ± 0.75	n = 18	[RAX] Radiometer ABL 80 Flex
66.55 ± 2.55	53.34 ± 0.86	32.20 ± 0.47	25.88 ± 0.31	21.84 ± 0.53	n = 10	[RAY] Radiometer ABL 90 Flex
65.77 ± 1.96	52.70 ± 1.28	31.22 ± 0.66	25.69 ± 0.56	21.26 ± 0.54	n = 53	[RAP] Radiometer ABL800 series
72.03 ± 1.32	56.46 ± 0.51	33.21 ± 0.39	26.33 ± 0.48	21.55 ± 0.69	n = 6	[ROW] Roche OMNI/Cobas series
74.23 ± 3.17	56.60 ± 2.47	33.16 ± 1.11	26.19 ± 0.88	22.05 ± 0.65	n = 15	[BYS] Siemens Rapid Point 405
73.98 ± 3.24	56.54 ± 2.05	33.13 ± 0.66	25.67 ± 1.04	21.44 ± 0.98	n = 17	[BYQ] Siemens Rapid Point 500
68.78 ± 2.16	53.00 ± 1.52	30.08 ± 0.71	23.20 ± 0.77	18.98 ± 0.57	n = 17	[BYT] Siemens RapidLab 1200 Series

Summary of Participant Performance (Mean and Standard Deviation)

Po2 (mmHg)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
166.74 ± 6.84	141.11 ± 5.86	209.98 ± 9.30	75.12 ± 8.66	128.48 ± 5.43	n = 222	[ ] All Instruments
163.58 ± 5.79	140.97 ± 6.07	191.35 ± 6.74	84.30 ± 5.74	128.19 ± 5.53	n = 28	[IAA] Abbott i-STAT
172.93 ± 3.25	142.24 ± 0.73	219.17 ± 5.77	70.84 ± 2.41	125.70 ± 3.10	n = 3	[EPO] Epocal epoc
176.52 ± 4.23	148.77 ± 2.60	216.45 ± 7.02	73.29 ± 1.96	133.80 ± 3.10	n = 13	[MAA] IL Gem Premier 3000
174.68 ± 3.69	147.53 ± 3.72	217.37 ± 3.60	73.00 ± 1.54	133.91 ± 3.52	n = 10	[MAD] IL Gem Premier 3500
169.34 ± 5.84	143.07 ± 1.98	210.64 ± 5.49	73.69 ± 2.23	129.76 ± 2.75	n = 21	[MAC] IL Gem Premier 4000
160.26 ± 4.76	135.78 ± 5.94	206.30 ± 4.68	80.14 ± 2.85	122.13 ± 2.17	n = 4	[AVQ] Opti Medical OPTI CCA
163.83 ± 3.97	135.29 ± 3.81	211.32 ± 8.29	59.59 ± 5.28	121.95 ± 4.53	n = 18	[RAX] Radiometer ABL 80 Flex
170.43 ± 6.24	140.82 ± 3.28	215.10 ± 6.00	59.00 ± 3.00	126.36 ± 3.16	n = 10	[RAY] Radiometer ABL 90 Flex
166.52 ± 4.26	142.25 ± 3.09	208.71 ± 5.53	79.67 ± 2.26	130.96 ± 2.47	n = 53	[RAP] Radiometer ABL800 series
174.95 ± 4.56	151.42 ± 4.25	210.63 ± 9.95	93.95 ± 2.66	134.12 ± 3.56	n = 6	[ROW] Roche OMNI/Cobas series
163.46 ± 4.70	137.75 ± 2.71	210.79 ± 6.68	74.40 ± 2.64	126.78 ± 0.78	n = 15	[BYS] Siemens Rapid Point 405
160.99 ± 4.38	135.16 ± 3.48	207.23 ± 7.49	74.02 ± 4.23	124.48 ± 4.14	n = 17	[BYQ] Siemens Rapid Point 500
163.45 ± 5.09	134.34 ± 4.23	211.38 ± 6.24	63.56 ± 2.82	118.89 ± 4.82	n = 17	[BYT] Siemens RapidLab 1200 Series

Summary of Participant Performance (Mean and Standard Deviation)

Glucose (mg/dL)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
87.5 ± 3.73	158.4 ± 5.96	261.3 ± 8.53	328.5 ± 9.85	51.7 ± 2.98	n = 64	[ ] All Instruments
86.2 ± 1.51	155.3 ± 1.62	263.0 ± 2.81	334.3 ± 3.65	51.4 ± 0.56	n = 7	[IAA] Abbott i-STAT
77.2 ± 1.46	147.0 ± 11.19	244.4 ± 4.85	313.4 ± 10.17	43.4 ± 3.25	n = 4	[MAA] IL Gem Premier 3000
81.2 ± 0.41	152.0 ± 3.15	256.4 ± 6.81	326.1 ± 8.03	44.6 ± 2.05	n = 5	[MAC] IL Gem Premier 4000
83.9 ± 2.05	150.0 ± 2.70	250.3 ± 5.09	315.5 ± 4.61	50.7 ± 2.26	n = 3	[RAY] Radiometer ABL 90 Flex
89.2 ± 2.18	161.5 ± 3.57	262.7 ± 4.75	329.9 ± 6.33	53.1 ± 1.74	n = 29	[RAP] Radiometer ABL800 series
88.8 ± 1.27	161.1 ± 2.04	267.8 ± 1.96	333.6 ± 2.91	50.7 ± 0.90	n = 4	[BYS] Siemens Rapid Point 405
85.5 ± 1.07	150.8 ± 1.07	245.3 ± 4.90	309.3 ± 4.75	50.2 ± 1.78	n = 5	[BYT] Siemens RapidLab 1200 Series

Sodium (mmol/L)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
110.4 ± 1.23	119.4 ± 1.93	122.1 ± 1.26	136.8 ± 2.09	152.3 ± 1.74	n = 83	[ ] All Instruments
110.3 ± 0.53	121.5 ± 0.93	121.4 ± 0.67	140.0 ± 0.60	154.9 ± 0.81	n = 11	[IAA] Abbott i-STAT
111.8 ± 0.41	122.0 ± 0.75	124.0 ± 0.75	139.8 ± 1.27	155.8 ± 1.27	n = 4	[MAA] IL Gem Premier 3000
110.8 ± 0.48	121.0 ± 0.00	122.8 ± 0.61	137.6 ± 0.55	151.4 ± 0.55	n = 10	[MAC] IL Gem Premier 4000
108.9 ± 1.13	118.5 ± 0.57	122.2 ± 0.41	137.0 ± 0.00	153.5 ± 0.57	n = 4	[RAY] Radiometer ABL 90 Flex
110.5 ± 0.84	119.2 ± 0.75	122.5 ± 0.89	136.5 ± 0.68	152.1 ± 0.79	n = 31	[RAP] Radiometer ABL800 series
107.2 ± 0.71	116.1 ± 0.54	120.1 ± 0.51	134.4 ± 0.78	151.5 ± 0.82	n = 5	[BYS] Siemens Rapid Point 405
107.7 ± 0.51	116.0 ± 0.00	119.7 ± 0.51	134.0 ± 0.90	150.5 ± 1.86	n = 3	[BYQ] Siemens Rapid Point 500
109.9 ± 1.57	117.0 ± 0.00	121.0 ± 0.00	133.5 ± 0.74	149.0 ± 0.00	n = 7	[BYT] Siemens RapidLab 1200 Series

Potassium (mmol/L)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
7.48 ± 0.15	2.53 ± 0.08	3.42 ± 0.08	4.81 ± 0.08	6.66 ± 0.11	n = 85	[ ] All Instruments
7.24 ± 0.07	2.50 ± 0.00	3.32 ± 0.04	4.77 ± 0.05	6.57 ± 0.05	n = 11	[IAA] Abbott i-STAT
7.45 ± 0.06	2.40 ± 0.00	3.30 ± 0.00	4.72 ± 0.04	6.58 ± 0.04	n = 4	[MAA] IL Gem Premier 3000
7.66 ± 0.06	2.50 ± 0.00	3.42 ± 0.05	4.90 ± 0.00	6.77 ± 0.07	n = 10	[MAC] IL Gem Premier 4000
7.28 ± 0.04	2.60 ± 0.08	3.40 ± 0.00	4.70 ± 0.00	6.48 ± 0.04	n = 4	[RAY] Radiometer ABL 90 Flex
7.50 ± 0.00	2.60 ± 0.00	3.50 ± 0.00	4.83 ± 0.05	6.67 ± 0.06	n = 31	[RAP] Radiometer ABL800 series
7.52 ± 0.09	2.50 ± 0.01	3.41 ± 0.02	4.80 ± 0.01	6.66 ± 0.05	n = 5	[BYS] Siemens Rapid Point 405
7.46 ± 0.06	2.50 ± 0.00	3.40 ± 0.00	4.80 ± 0.00	6.64 ± 0.06	n = 5	[BYQ] Siemens Rapid Point 500
7.59 ± 0.16	2.42 ± 0.05	3.40 ± 0.00	4.78 ± 0.05	6.75 ± 0.11	n = 7	[BYT] Siemens RapidLab 1200 Series

Summary of Participant Performance (Mean and Standard Deviation)

Chloride (mmol/L)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
72.4 ± 2.27	82.6 ± 2.64	70.3 ± 2.86	103.2 ± 2.53	115.8 ± 3.14	n = 55	[ ] All Instruments
70.1 ± 1.13	77.2 ± 1.00	65.5 ± 0.57	97.0 ± 0.55	109.0 ± 0.55	n = 6	[IAA] Abbott i-STAT
75.0 ± 0.00	85.0 ± 0.00	74.6 ± 0.55	106.0 ± 1.00	121.5 ± 0.83	n = 5	[MAC] IL Gem Premier 4000
78.1 ± 1.13	87.7 ± 0.90	75.7 ± 0.90	107.5 ± 1.22	120.1 ± 1.13	n = 4	[NO-] NOVA
71.6 ± 0.97	81.9 ± 0.85	69.6 ± 1.14	102.8 ± 0.84	115.2 ± 1.17	n = 25	[RAP] Radiometer ABL800 series
72.5 ± 0.57	83.0 ± 0.00	69.8 ± 0.41	103.0 ± 0.75	115.9 ± 1.13	n = 4	[BYS] Siemens Rapid Point 405
74.0 ± 0.00	84.0 ± 0.00	71.0 ± 0.90	103.3 ± 0.51	116.0 ± 0.90	n = 3	[BYQ] Siemens Rapid Point 500
75.8 ± 0.41	85.8 ± 0.41	73.3 ± 1.51	105.8 ± 0.41	117.5 ± 1.22	n = 4	[BYT] Siemens RapidLab 1200 Series

Ionized Calcium (mmol/L)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
1.354 ± 0.048	1.008 ± 0.028	0.844 ± 0.042	0.741 ± 0.040	0.553 ± 0.056	n = 92	[ ] All Instruments
1.333 ± 0.019	0.999 ± 0.009	0.778 ± 0.006	0.708 ± 0.008	0.499 ± 0.007	n = 11	[IAA] Abbott i-STAT
1.295 ± 0.192	0.995 ± 0.012	0.802 ± 0.004	0.705 ± 0.012	0.500 ± 0.015	n = 4	[MAA] IL Gem Premier 3000
1.378 ± 0.015	1.021 ± 0.010	0.831 ± 0.014	0.720 ± 0.000	0.491 ± 0.005	n = 12	[MAC] IL Gem Premier 4000
1.335 ± 0.016	0.990 ± 0.000	0.840 ± 0.000	0.730 ± 0.000	0.550 ± 0.000	n = 5	[RAY] Radiometer ABL 90 Flex
1.401 ± 0.011	1.038 ± 0.012	0.885 ± 0.012	0.789 ± 0.020	0.615 ± 0.024	n = 29	[RAP] Radiometer ABL800 series
1.325 ± 0.027	0.970 ± 0.009	0.792 ± 0.015	0.700 ± 0.000	0.524 ± 0.010	n = 3	[ROW] Roche OMNI/Cobas series
1.306 ± 0.008	0.980 ± 0.000	0.830 ± 0.000	0.719 ± 0.011	0.520 ± 0.016	n = 6	[BYS] Siemens Rapid Point 405
1.315 ± 0.008	0.986 ± 0.011	0.835 ± 0.008	0.718 ± 0.018	0.532 ± 0.018	n = 5	[BYQ] Siemens Rapid Point 500
1.290 ± 0.018	0.985 ± 0.024	0.864 ± 0.025	0.746 ± 0.040	0.582 ± 0.029	n = 11	[BYT] Siemens RapidLab 1200 Series

Lactate (mmol/L)

Specimen: G66	Specimen: G67	Specimen: G68	Specimen: G69	Specimen: G70	Number	[Code] Instrument or Reagent System
3.70 ± 0.17	5.52 ± 0.29	7.50 ± 0.38	8.72 ± 0.51	1.87 ± 0.11	n = 71	[ ] All Instruments
3.74 ± 0.11	5.50 ± 0.14	7.52 ± 0.16	8.56 ± 0.20	1.82 ± 0.10	n = 11	[IAA] Abbott i-STAT
3.56 ± 0.06	5.43 ± 0.09	7.56 ± 0.11	8.54 ± 0.06	1.74 ± 0.06	n = 5	[MAA] IL Gem Premier 3000
3.31 ± 0.11	4.89 ± 0.21	6.93 ± 0.26	7.78 ± 0.34	1.72 ± 0.07	n = 6	[MAC] IL Gem Premier 4000
3.64 ± 0.15	5.49 ± 0.23	7.69 ± 0.36	9.15 ± 0.37	1.90 ± 0.10	n = 5	[RAY] Radiometer ABL 90 Flex
3.73 ± 0.13	5.63 ± 0.22	7.46 ± 0.30	8.85 ± 0.40	1.90 ± 0.07	n = 26	[RAP] Radiometer ABL800 series
3.82 ± 0.10	5.62 ± 0.09	8.01 ± 0.28	9.24 ± 0.53	1.93 ± 0.10	n = 6	[BYQ] Siemens Rapid Point 500
3.70 ± 0.08	5.27 ± 0.09	7.17 ± 0.09	8.14 ± 0.29	2.00 ± 0.00	n = 4	[BYT] Siemens RapidLab 1200 Series