

Blood pH and Gas/Chemistry Educational Proficiency Test Program

Statistical Summary – March 2014 (Event 14-1)

This statistical report summarizes participant data for the five Blood pH and Gas/Chemistry proficiency survey specimens shipped March 10, 2014. Test specimens were commercially prepared and contained carbon dioxide and oxygen balanced with nitrogen in a physiologically buffered matrix. Five specimens (G41, G42, G43, G44, G45) 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: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code] Instrument or Reagent System
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7.628 ± 0.031	7.422 ± 0.017	7.251 ± 0.017	7.572 ± 0.025	7.132 ± 0.024	n = 218	[] All Instruments
7.630 ± 0.000	7.423 ± 0.012	7.269 ± 0.017	7.569 ± 0.014	7.159 ± 0.009	n = 6	[AVQ] Opti Medical OPTI CCA
7.623 ± 0.004	7.419 ± 0.005	7.240 ± 0.003	7.573 ± 0.005	7.107 ± 0.005	n = 25	[BYS] Siemens Rapid Point 405
7.621 ± 0.003	7.418 ± 0.006	7.238 ± 0.005	7.568 ± 0.006	7.103 ± 0.006	n = 8	[BYQ] Siemens Rapid Point 500
7.648 ± 0.006	7.446 ± 0.005	7.276 ± 0.006	7.595 ± 0.005	7.158 ± 0.005	n = 19	[BYT] Siemens RapidLab 1200 Series
7.693 ± 0.006	7.446 ± 0.009	7.278 ± 0.008	7.627 ± 0.007	7.167 ± 0.007	n = 22	[IAA] i-STAT
7.664 ± 0.006	7.436 ± 0.008	7.248 ± 0.009	7.595 ± 0.006	7.111 ± 0.006	n = 14	[MAA] IL Gem Premier 3000
7.637 ± 0.007	7.420 ± 0.000	7.242 ± 0.009	7.568 ± 0.008	7.106 ± 0.009	n = 16	[MAC] IL Gem Premier 4000
7.660 ± 0.000	7.437 ± 0.005	7.250 ± 0.006	7.596 ± 0.006	7.115 ± 0.006	n = 12	[MAD] IL Gem Premier 3500
7.623 ± 0.004	7.434 ± 0.006	7.279 ± 0.005	7.569 ± 0.010	7.168 ± 0.005	n = 6	[NOG] NOVA Critical Care Xpress
7.600 ± 0.015	7.407 ± 0.011	7.248 ± 0.009	7.551 ± 0.015	7.141 ± 0.007	n = 17	[RAX] Radiometer ABL 80 Flex
7.623 ± 0.000	7.418 ± 0.009	7.248 ± 0.006	7.567 ± 0.008	7.128 ± 0.005	n = 5	[RAY] Radiometer ABL 90 Flex
7.606 ± 0.002	7.415 ± 0.013	7.249 ± 0.006	7.555 ± 0.002	7.133 ± 0.000	n = 3	[RAN] Radiometer ABL700 series
7.605 ± 0.004	7.408 ± 0.005	7.244 ± 0.005	7.553 ± 0.004	7.132 ± 0.004	n = 52	[RAP] Radiometer ABL800 series
7.591 ± 0.014	7.410 ± 0.016	7.258 ± 0.011	7.535 ± 0.014	7.146 ± 0.010	n = 6	[ROW] Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Pco2 (mmHg)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code]	Instrument or Reagent System
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21.74 ± 0.97	38.08 ± 1.85	51.98 ± 3.05	25.17 ± 1.28	71.29 ± 5.22	n = 218	[]	All Instruments
22.74 ± 0.75	38.11 ± 1.39	50.65 ± 1.98	26.00 ± 0.77	70.75 ± 2.44	n = 6	[AVQ]	Opti Medical OPTI CCA
22.40 ± 0.66	39.83 ± 1.37	56.66 ± 1.67	25.62 ± 0.72	79.34 ± 3.19	n = 25	[BYS]	Siemens Rapid Point 405
22.83 ± 0.70	39.45 ± 0.75	55.58 ± 0.74	26.19 ± 1.07	77.99 ± 2.20	n = 8	[BYQ]	Siemens Rapid Point 500
20.75 ± 0.97	36.48 ± 1.01	50.52 ± 1.54	23.78 ± 0.93	69.48 ± 2.07	n = 19	[BYT]	Siemens RapidLab 1200 Series
20.93 ± 0.47	34.25 ± 1.20	47.39 ± 1.41	23.07 ± 0.59	65.37 ± 2.00	n = 22	[IAA]	i-STAT
21.00 ± 0.00	39.42 ± 1.77	54.35 ± 1.59	24.89 ± 0.97	76.81 ± 2.75	n = 14	[MAA]	IL Gem Premier 3000
21.22 ± 0.78	37.72 ± 1.21	50.41 ± 1.57	24.46 ± 0.81	71.39 ± 2.87	n = 16	[MAC]	IL Gem Premier 4000
21.46 ± 1.12	39.36 ± 0.65	54.17 ± 1.22	25.10 ± 0.82	75.66 ± 2.76	n = 12	[MAD]	IL Gem Premier 3500
22.05 ± 0.99	37.94 ± 0.35	50.88 ± 0.85	25.65 ± 0.46	67.32 ± 1.38	n = 6	[NOG]	NOVA Critical Care Xpress
21.74 ± 1.09	38.58 ± 0.89	53.65 ± 1.25	25.34 ± 0.93	73.56 ± 1.83	n = 17	[RAX]	Radiometer ABL 80 Flex
21.92 ± 0.37	37.26 ± 0.77	50.54 ± 0.28	24.82 ± 1.21	67.88 ± 0.56	n = 5	[RAY]	Radiometer ABL 90 Flex
22.04 ± 0.79	36.99 ± 1.91	50.23 ± 0.68	25.90 ± 0.82	68.58 ± 0.77	n = 3	[RAN]	Radiometer ABL700 series
22.05 ± 0.47	38.06 ± 0.68	51.08 ± 1.02	25.90 ± 0.40	68.63 ± 1.70	n = 52	[RAP]	Radiometer ABL800 series
22.83 ± 1.13	39.77 ± 2.08	54.56 ± 1.80	26.82 ± 1.17	73.96 ± 0.89	n = 6	[ROW]	Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Po2 (mmHg)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code]	Instrument or Reagent System
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130.34 ± 6.00	89.59 ± 7.51	141.11 ± 6.58	74.41 ± 8.44	161.84 ± 7.49	n = 218	[]	All Instruments
128.15 ± 5.04	92.00 ± 1.54	139.06 ± 8.52	80.29 ± 5.37	157.56 ± 11.98	n = 6	[AVQ]	Opti Medical OPTI CCA
127.48 ± 2.36	88.29 ± 2.61	137.64 ± 3.06	73.86 ± 3.83	156.40 ± 4.64	n = 25	[BYS]	Siemens Rapid Point 405
125.26 ± 2.47	88.14 ± 2.60	134.77 ± 1.20	72.28 ± 1.45	153.31 ± 4.36	n = 8	[BYQ]	Siemens Rapid Point 500
124.20 ± 5.07	82.38 ± 5.16	136.52 ± 4.64	67.76 ± 6.24	161.79 ± 4.96	n = 19	[BYT]	Siemens RapidLab 1200 Series
130.81 ± 4.94	99.33 ± 5.65	141.48 ± 5.79	83.59 ± 4.25	158.66 ± 6.99	n = 22	[IAA]	i-STAT
138.68 ± 3.43	88.02 ± 1.78	149.49 ± 4.46	73.77 ± 3.10	170.96 ± 4.05	n = 14	[MAA]	IL Gem Premier 3000
132.10 ± 3.42	90.49 ± 4.01	144.67 ± 5.73	71.90 ± 2.38	167.02 ± 9.40	n = 16	[MAC]	IL Gem Premier 4000
135.95 ± 3.01	87.53 ± 1.62	148.10 ± 4.37	71.99 ± 2.31	171.44 ± 3.11	n = 12	[MAD]	IL Gem Premier 3500
129.49 ± 1.17	84.01 ± 4.31	142.27 ± 4.19	67.29 ± 4.71	165.19 ± 5.48	n = 6	[NOG]	NOVA Critical Care Xpress
121.00 ± 4.12	75.40 ± 3.70	134.17 ± 5.58	58.34 ± 2.53	158.89 ± 4.39	n = 17	[RAX]	Radiometer ABL 80 Flex
123.89 ± 3.37	73.81 ± 1.54	138.20 ± 3.78	53.89 ± 0.91	161.82 ± 6.11	n = 5	[RAY]	Radiometer ABL 90 Flex
130.22 ± 3.23	95.18 ± 14.19	137.74 ± 3.16	75.15 ± 4.51	159.26 ± 2.26	n = 3	[RAN]	Radiometer ABL700 series
132.06 ± 3.29	92.44 ± 2.54	141.73 ± 3.62	77.29 ± 2.80	160.85 ± 4.81	n = 52	[RAP]	Radiometer ABL800 series
136.82 ± 1.83	109.15 ± 2.71	153.96 ± 2.03	94.92 ± 3.35	172.19 ± 1.29	n = 6	[ROW]	Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Glucose (mg/dL)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code] Instrument
49.6 ± 2.51	222.8 ± 8.82	156.8 ± 8.50	321.4 ± 12.29	87.2 ± 5.91	n = 66	[] All Instruments
49.7 ± 0.51	232.0 ± 1.80	160.1 ± 2.86	333.9 ± 2.86	87.0 ± 0.90	n = 3	[BYS] Siemens Rapid Point 405
47.8 ± 2.37	214.0 ± 4.71	152.1 ± 2.33	306.5 ± 6.95	84.6 ± 1.98	n = 5	[BYT] Siemens RapidLab 1200 Series
50.1 ± 0.75	217.1 ± 2.47	149.9 ± 2.21	316.9 ± 3.24	82.1 ± 1.21	n = 8	[IAA] i-STAT
45.2 ± 2.11	214.8 ± 8.57	144.8 ± 3.59	320.5 ± 6.49	76.8 ± 2.68	n = 4	[MAA] IL Gem Premier 3000
46.6 ± 1.37	216.0 ± 4.93	146.4 ± 4.05	316.1 ± 6.77	80.0 ± 4.22	n = 5	[MAC] IL Gem Premier 4000
44.0 ± 0.90	213.4 ± 5.58	146.3 ± 0.51	319.3 ± 0.51	75.7 ± 0.51	n = 3	[MAD] IL Gem Premier 3500
50.1 ± 2.23	243.1 ± 12.52	170.4 ± 4.55	342.7 ± 19.15	92.4 ± 3.04	n = 5	[NOG] NOVA Critical Care Xpress
50.5 ± 1.77	226.3 ± 5.61	161.5 ± 3.80	323.5 ± 10.13	91.0 ± 2.45	n = 25	[RAP] Radiometer ABL800 series

Sodium (mmol/L)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code] Instrument
152.9 ± 1.77	132.9 ± 2.00	119.4 ± 1.88	137.1 ± 2.13	109.5 ± 1.41	n = 83	[] All Instruments
152.6 ± 1.02	130.7 ± 0.51	116.7 ± 0.51	135.3 ± 0.51	106.7 ± 0.51	n = 3	[BYS] Siemens Rapid Point 405
151.7 ± 0.51	130.3 ± 0.51	116.3 ± 0.51	135.0 ± 0.00	107.0 ± 0.90	n = 3	[BYQ] Siemens Rapid Point 500
150.7 ± 0.87	130.2 ± 0.41	116.7 ± 0.54	134.0 ± 0.00	109.4 ± 2.09	n = 8	[BYT] Siemens RapidLab 1200 Series
155.4 ± 0.83	136.0 ± 0.00	122.0 ± 0.74	140.3 ± 0.67	109.6 ± 0.81	n = 10	[IAA] i-STAT
157.2 ± 1.46	134.7 ± 0.90	120.0 ± 0.75	140.0 ± 0.75	108.8 ± 1.27	n = 4	[MAA] IL Gem Premier 3000
151.7 ± 0.61	133.7 ± 0.67	121.0 ± 0.00	138.0 ± 0.69	110.3 ± 0.61	n = 9	[MAC] IL Gem Premier 4000
156.0 ± 0.90	135.0 ± 0.90	120.3 ± 0.51	139.7 ± 0.51	109.0 ± 0.90	n = 3	[MAD] IL Gem Premier 3500
152.4 ± 0.55	130.0 ± 0.00	118.4 ± 1.09	135.5 ± 0.83	109.8 ± 0.80	n = 5	[NOG] NOVA Critical Care Xpress
153.7 ± 0.51	133.0 ± 0.00	119.3 ± 0.51	137.7 ± 0.51	111.3 ± 3.37	n = 3	[RAY] Radiometer ABL 90 Flex
152.8 ± 0.86	132.6 ± 0.80	119.0 ± 0.97	136.6 ± 1.14	109.4 ± 1.15	n = 27	[RAP] Radiometer ABL800 series
152.4 ± 1.02	133.3 ± 0.51	120.3 ± 0.51	137.0 ± 0.00	110.7 ± 0.51	n = 3	[ROW] Roche OMNI/Cobas series

Summary of Participant Performance (Mean and Standard Deviation)

Potassium (mmol/L)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code]	Instrument
6.67 ± 0.11	4.24 ± 0.07	2.54 ± 0.08	4.80 ± 0.07	7.47 ± 0.16	n = 83	[]	All Instruments
6.73 ± 0.05	4.26 ± 0.05	2.50 ± 0.00	4.80 ± 0.01	7.46 ± 0.05	n = 4	[BYS]	Siemens Rapid Point 405
6.67 ± 0.08	4.22 ± 0.04	2.50 ± 0.00	4.78 ± 0.04	7.42 ± 0.13	n = 4	[BYQ]	Siemens Rapid Point 500
6.75 ± 0.10	4.17 ± 0.06	2.43 ± 0.06	4.77 ± 0.06	7.58 ± 0.15	n = 8	[BYT]	Siemens RapidLab 1200 Series
6.60 ± 0.00	4.20 ± 0.00	2.50 ± 0.00	4.80 ± 0.00	7.25 ± 0.06	n = 10	[IAA]	i-STAT
6.53 ± 0.09	4.12 ± 0.04	2.42 ± 0.04	4.70 ± 0.00	7.40 ± 0.00	n = 4	[MAA]	IL Gem Premier 3000
6.73 ± 0.07	4.28 ± 0.04	2.50 ± 0.00	4.86 ± 0.06	7.67 ± 0.09	n = 8	[MAC]	IL Gem Premier 4000
6.57 ± 0.05	4.13 ± 0.05	2.43 ± 0.05	4.70 ± 0.00	7.46 ± 0.10	n = 3	[MAD]	IL Gem Premier 3500
6.96 ± 0.11	4.30 ± 0.00	2.60 ± 0.00	4.96 ± 0.06	7.80 ± 0.09	n = 5	[NOG]	NOVA Critical Care Xpress
6.50 ± 0.00	4.20 ± 0.00	2.60 ± 0.00	4.70 ± 0.00	7.30 ± 0.00	n = 3	[RAY]	Radiometer ABL 90 Flex

Chloride (mmol/L)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code]	Instrument or Reagent System
116.0 ± 3.17	96.9 ± 3.03	82.5 ± 2.88	102.2 ± 2.96	72.8 ± 2.76	n = 56	[]	All Instruments
117.7 ± 1.37	98.3 ± 0.51	83.0 ± 0.00	103.3 ± 0.51	73.0 ± 0.90	n = 3	[BYS]	Siemens Rapid Point 405
116.3 ± 0.51	98.0 ± 0.00	83.7 ± 0.51	102.3 ± 0.51	73.3 ± 0.51	n = 3	[BYQ]	Siemens Rapid Point 500
118.2 ± 1.27	99.6 ± 1.90	91.7 ± 11.74	104.7 ± 0.90	76.3 ± 1.51	n = 4	[BYT]	Siemens RapidLab 1200 Series
111.6 ± 0.79	92.0 ± 0.90	78.6 ± 0.79	97.5 ± 0.57	71.0 ± 0.90	n = 6	[IAA]	i-STAT
121.5 ± 1.07	100.6 ± 1.09	85.0 ± 0.00	105.8 ± 1.55	75.6 ± 0.55	n = 5	[MAC]	IL Gem Premier 4000
120.5 ± 0.83	101.8 ± 0.80	88.0 ± 0.00	106.5 ± 0.83	78.6 ± 0.55	n = 5	[NOG]	NOVA Critical Care Xpress
114.9 ± 0.93	95.9 ± 0.82	81.7 ± 0.72	101.4 ± 0.94	71.8 ± 1.10	n = 21	[RAP]	Radiometer ABL800 series

Summary of Participant Performance (Mean and Standard Deviation)

Ionized Calcium (mmol/L)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code]	Instrument
0.545 ± 0.064	1.194 ± 0.035	1.031 ± 0.031	0.730 ± 0.045	1.471 ± 0.050	n = 89	[]	All Instruments
0.506 ± 0.010	1.169 ± 0.018	1.006 ± 0.010	0.699 ± 0.013	1.434 ± 0.020	n = 7	[BYS]	Siemens Rapid Point 405
0.520 ± 0.027	1.170 ± 0.009	1.022 ± 0.015	0.706 ± 0.010	1.467 ± 0.034	n = 3	[BYQ]	Siemens Rapid Point 500
0.550 ± 0.036	1.139 ± 0.021	1.007 ± 0.013	0.735 ± 0.032	1.418 ± 0.027	n = 12	[BYT]	Siemens RapidLab 1200 Series
0.495 ± 0.009	1.196 ± 0.006	1.018 ± 0.013	0.686 ± 0.006	1.424 ± 0.009	n = 6	[IAA]	i-STAT
0.489 ± 0.021	1.208 ± 0.028	1.028 ± 0.011	0.695 ± 0.011	1.497 ± 0.008	n = 5	[MAA]	IL Gem Premier 3000
0.463 ± 0.009	1.194 ± 0.011	1.030 ± 0.010	0.686 ± 0.014	1.502 ± 0.012	n = 9	[MAC]	IL Gem Premier 4000
0.480 ± 0.027	1.205 ± 0.027	1.014 ± 0.010	0.677 ± 0.023	1.497 ± 0.005	n = 3	[MAD]	IL Gem Premier 3500
0.552 ± 0.004	1.171 ± 0.019	1.017 ± 0.016	0.735 ± 0.006	1.443 ± 0.024	n = 4	[NOG]	NOVA Critical Care Xpress
0.548 ± 0.004	1.165 ± 0.012	1.017 ± 0.009	0.722 ± 0.004	1.440 ± 0.011	n = 4	[RAY]	Radiometer ABL 90 Flex
0.616 ± 0.028	1.223 ± 0.015	1.066 ± 0.015	0.775 ± 0.018	1.509 ± 0.020	n = 26	[RAP]	Radiometer ABL800 series
0.494 ± 0.016	1.192 ± 0.004	0.995 ± 0.012	0.692 ± 0.013	1.418 ± 0.020	n = 4	[ROW]	Roche OMNI/Cobas series

Ionized Magnesium (mmol/L)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code]	Instrument
1.040 ± 0.023	0.690 ± 0.023	1.010 ± 0.034	1.375 ± 0.040	0.665 ± 0.063	n = 2	[]	All Instruments

Lactate (mmol/L)

Specimen: G41	Specimen: G42	Specimen: G43	Specimen: G44	Specimen: G45	Number	[Code]	Instrument
1.85 ± 0.13	6.41 ± 0.29	5.55 ± 0.28	9.53 ± 0.47	3.56 ± 0.18	n = 58	[]	All Instruments
2.04 ± 0.10	6.82 ± 0.41	5.75 ± 0.27	9.90 ± 0.18	3.70 ± 0.09	n = 3	[BYQ]	Siemens Rapid Point 500
1.95 ± 0.12	6.33 ± 0.09	5.58 ± 0.13	9.34 ± 0.18	3.59 ± 0.11	n = 4	[BYT]	Siemens RapidLab 1200 Series
1.90 ± 0.01	6.38 ± 0.05	5.51 ± 0.04	9.34 ± 0.06	3.59 ± 0.04	n = 6	[IAA]	i-STAT
1.74 ± 0.06	6.34 ± 0.27	5.28 ± 0.21	9.42 ± 0.33	3.35 ± 0.08	n = 5	[MAA]	IL Gem Premier 3000
1.73 ± 0.05	6.22 ± 0.15	5.30 ± 0.09	9.36 ± 0.10	3.37 ± 0.05	n = 3	[MAD]	IL Gem Premier 3500
2.00 ± 0.09	6.69 ± 0.20	5.85 ± 0.19	9.84 ± 0.62	3.73 ± 0.23	n = 3	[NOG]	NOVA Critical Care Xpress
1.83 ± 0.05	6.50 ± 0.18	5.52 ± 0.24	10.66 ± 0.84	3.54 ± 0.10	n = 3	[RAY]	Radiometer ABL 90 Flex
1.85 ± 0.11	6.47 ± 0.33	5.62 ± 0.23	9.64 ± 0.57	3.61 ± 0.16	n = 22	[RAP]	Radiometer ABL800 series