i-STAT®Alinity v

Hospital Resource Guide

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i-STAT Alinity v

The i-STAT Alinity v delivers blood gas, acid-base, electrolyte, chemistry, and hematology measurements in a completely portable, handheld package. Accuracy is ensured by extensive quality checks and calibrations that occur automatically with each cartridge run. Results are obtained in as little as three minutes - making it the ideal solution for critical care situations, anesthetic monitoring, and fieldwork.

Cartridge Storage:
Refrigerate at 2 °C to 8 °C (35 °F to 46 °F).

Cartridge Stability:
Cartridges may be stored at room temperature 18-30 °C (64-86 °F), but this will decrease the shelf life. Refer to the cartridge box for room storage shelf life information. Once a cartridge has been warmed to room temperature, do not return it to the refrigerator.

Allow the cartridge to warm for 5 minutes at room temperature before removing from the pouch for analysis.

Use cartridges immediately after opening pouch.

Sample Preparation and Considerations:
- Whole blood samples without anticoagulant or whole blood collected into a lithium heparin tube may be used.
- Blood may be either venous or arterial, depending on the analytes to be measured.
- Venous samples are typically performed for acid-base, electrolyte, and hematologic studies.
- Samples for iCa should be collected in balanced heparin.
- For most accurate results, run samples immediately after collection.
  - Samples for pH, pCO_2, pO_2, TCO_2, and iCa should be tested within 10 minutes if stored anaerobically.
  - All other analytes should be tested within 30 minutes.

For additional information regarding individual cartridges and tests sample collection and handling, see Cartridge & Test Information sheets: **www.pointofcare.abbott**

Acid-Base Utilization

Acid-base analysis is vital to your diagnostic protocols[1]

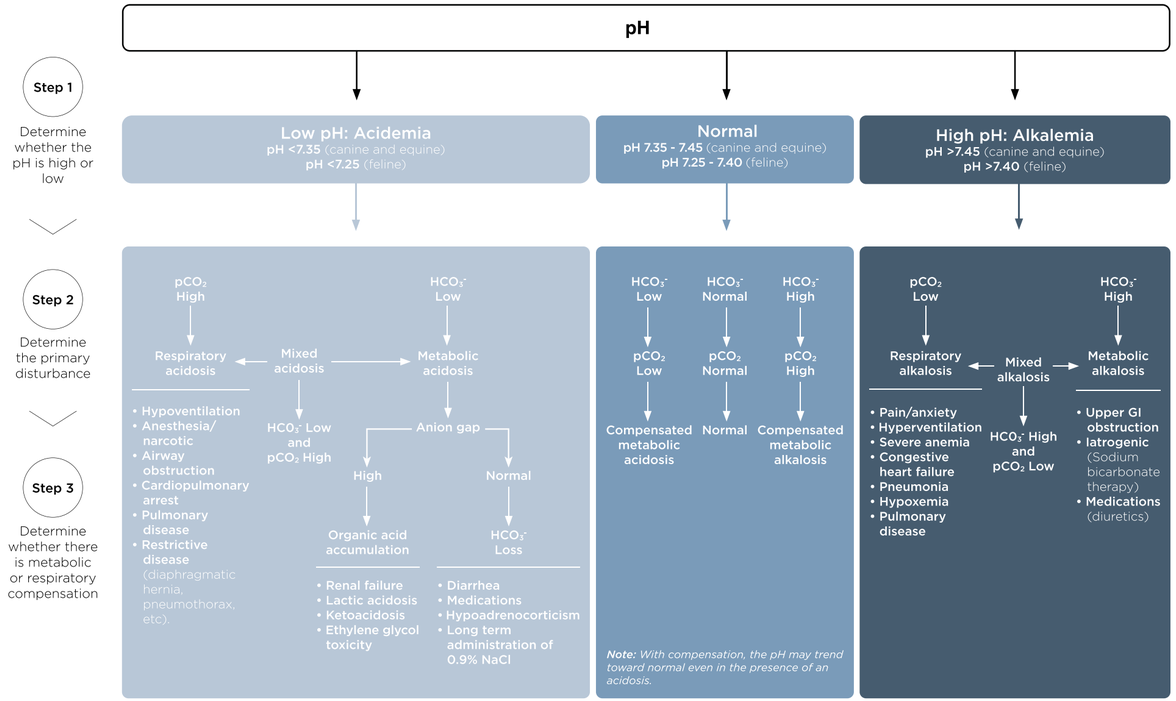
Chemical reactions, especially those occurring *in vivo*, are dependent on many factors, none more important than optimal pH. Illness, whether acute or chronic, often results in pH abnormalities. Failure to recognize and address these abnormalities may result in:

- Missed diagnoses
- Inappropriate treatment
- Delayed or poor patient response to therapy
- Increased time in hospital
- Frequent relapse
- Inability to thrive
- Patient death

Acid-base definitions	
pH	Measurement of the H^+ ion concentration
pCO_2	Partial pressure of the carbon dioxide; reflects the amount of carbonic acid present
HCO_3^-	Bicarbonate, the body's major buffer
Anion Gap	Represents the concentration of all unmeasured anions in the plasma; the difference between measured cations and measured anions ($Na^+ + K^+$)-($Cl^- + HCO_3^-$); helpful in determining the cause of acid-base abnormalities.
Base Excess	mEq/L of strong base or acid needed to return the pH to 7.40.
Electrolytes	Na^+, K^+, Cl^-
TCO_2	Total carbon dioxide, which is primarily HCO_3^- (95%)
pO_2	Partial pressure of oxygen; measurement of the tension or pressure of oxygen dissolved in blood

Note: A venous sample is acceptable for interpretation of acid-base parameters. For detailed information on pO_2, an arterial sample is recommended.

Acid-Base Diagnostic Chart[3]



Common Disease States Where Acid-Base Analysis Is Beneficial

EXPECTED ACID-BASE ABNORMALITIES (depending on species)

ACIDEMIA[4]				ALKALEMIA[5]	
pH < 7.35 (canine and equine) **pH < 7.25** (feline)				**pH > 7.45** (canine and equine) **pH > 7.40** (feline)	
Metabolic acidosis H^+ ⋙ pH (Most common presentation) HCO_3^- ⋙ pH (rare in small animals)				**Metabolic alkalosis** HCO_3^- or H^+ ⋙ pH	**Respiratory alkalosis** O_2 ⋙ hyperventilation ⋙ pCO_2 ⋙ pH Reduced ability to uptake or exchange O_2
LACTIC ACIDOSIS	**VOMITING/ DIARRHEA**	**RENAL FAILURE**	**DIABETIC KETOACIDOSIS**	**UPPER GI OBSTRUCTION**	**RESPIRATORY**

• An increase in lactic acid production as a result of decreased tissue perfusion and/or decreased oxygenation
• Occurs in many disease states, most commonly:
  • Hypovolemia/ shock
  • Vomiting/diarrhea
  • Colic
  • Gastric torsion (GDV)
	• Lactic acidosis secondary to hypovolemia
	• +/- loss of sodium bicarbonate ($NaHCO_3$)
	• Electrolyte abnormalities
	• Anion gap often normal
		• Uremic toxins increase acid levels
		• Loss of sodium bicarbonate ($NaHCO_3$) OR hydrogen ion retention (H^+)
		• Electrolyte abnormalities
		• Lactic acidosis with anemia and/or severe dehydration
			• Ketoacids
			• Lactic acidosis
			• Electrolyte abnormalities
			• High/normal anion gap, depending on severity
				• Loss of Cl^- in the form of HCl (hydrochloric acid)
				• Hypochloremia is common
				• Potential loss of free body water
					• Hyperventilation
					• Pain
					• Iatrogenic (mechanical ventilation)
					• Decreased tissue perfusion (due to anemia, dehydration, other)
					• Compensation for metabolic acidosis (hyperventilation)
					• Head trauma

CARTRIDGE CHOICES

CG4+: Acid-base, lactate, pO_2, TCO_2

Helpful with GDV and other severe GI cases

Diagnosis and monitoring for emergencies and/or severe cases

CG8+: Acid-base, pO_2, HCT, glucose, Na, K, iCa

Helpful for monitoring diabetic and kidney disease patients

Diagnosis and monitoring for emergencies and/or severe cases

Neoplasia screening

Disclaimer: *Cartridge examples are for suggestive purposes only. Diagnostic testing choices should be based on medical history, physical examination and the patient's response to treatment.*

i-STAT Alinity v Cartridge Test Menu

The i-STAT Alinity v uses a wide range of disposable, single-use cartridges that contain the necessary reagents to provide reference lab quality results, while improving efficiency throughout the animal health continuum of care.

		CHEM8+	CG4+	CG8+	G	Crea
Hematology	Hematocrit (Hct)	●		●		
	Hemoglobin (Hb)*	●		●		
Chemistry	Blood Urea Nitrogen (BUN)	●				
	Creatinine (Crea)	●				●
	Ionized Calcium (iCa)	●		●		
	Glucose (Glu)	●		●	●	
Electrolytes	Chloride (Cl)	●				
	Sodium (Na)	●		●		
	Potassium (K)	●		●		
Acid Base	pH		●	●		
	Partial Pressure of Carbon Dioxide (PCO_2)		●	●		
	Bicarbonate (HCO_3)*		●	●		
	Total Carbon Dioxide (TCO_2)*	●	●	●		
	Anion Gap (AnGap)*	●				
	Base Excess (BE)*		●	●		
Blood Gas	Partial Pressure of Oxygen (PO_2)		●	●		
	Oxygen Saturation (sO_2)*		●	●		
Specialty	Lactate (Lac)		●			

*Calculated Value. Note TCO2 is a measured values on the CHEM8+ cartridge, but is a calculated value on the CG4+and CG8+, cartidges.

i-STAT Alinity v System and Reference Interval[6]

		Units	System interval	Reference interval***		
				Canine	Feline	Equine
Hematology	Hematocrit (Hct)	% PCV	15 - 75	35 - 57	26 - 50	25 - 44
	Hemoglobin (Hb)*	g/dL	5.1 - 25.5	12 - 19	9 - 17	8 - 15
Chemistry	Blood Urea Nitrogen (BUN)	mg/dL	3 - 140	7 - 26	17 - 35	4 - 27
	Creatinine (Crea)	mg/dL	0.2 - 20.0	0.5 - 1.4	0.8 - 2	0.7 - 2
	Ionized Calcium (iCa)	mmol/L	0.25 - 2.50	1.21 - 1.45	1.04 - 1.44	1.31 - 1.83
	Glucose (Glu)	mg/dL	20 - 700	81 - 118	70 - 161	71 - 111
Electrolytes	Chloride (Cl)	mEq/L	65 - 140	109 - 121	116 - 127	95 - 105
	Sodium (Na)	mEq/L	100 - 180	141 - 150	145 - 157	132 - 139
	Potassium (K)	mEq/L	2.0 - 9.0	3.3 - 4.9	3.4 - 4.9	2.6 - 5.8
Acid-Base	pH		6.5 - 8.2	7.32 - 7.44	7.28 - 7.46	7.37 - 7.46
	Partial Pressure of Carbon Dioxide (PCO_2)	mmHg	5 - 130	26 - 45	25 - 42	39 - 52
	Bicarbonate (HCO_3)*	mEq/L	1.0 - 85.0	16 - 26	15 - 24	25 - 33
	Total Carbon Dioxide (TCO_2)	mEq/L	5 - 50	16 - 26	16 - 24	25 - 33
	Anion Gap (AnGap)*	mEq/L	(-10) - (+99)	8 - 21	8 - 20	5 - 17
	Base Excess (BE)*	mEq/L	(-30) - (+30)	(-9) - (+1)	(-11) - (-1)	0 - 9
Blood Gas (arterial)**	Partial Pressure of Oxygen (PO_2)	mmHg	5 - 800	85 - 100	90 - 110	62 - 170
	Oxygen Saturation (sO_2)*	%	0 - 100	95 - 100	95 - 100	96 - 100
Blood Gas** (venous)	Partial Pressure of Oxygen (PO_2)	mmHg	5 - 800	25 - 70	27 - 51	22 - 80
	Oxygen Saturation (sO_2)*	%	0 - 100	49 - 100	52 - 91	49 - 100
Specialty	Lactate (Lac)	mmol/L	0.30 - 20.00	0.4 - 2.8	0.4 - 2.6	0.3 - 1.1

*Calculated Value
**Arterial blood gas ranges are built into software. Venous blood gas ranges are not available in the software at this time.
***Reference interval are for venous samples unless specified

Highlighted cells reflect interval for arterial samples. Equine arterial ranges developed for i-STAT Alinity v. Canine and feline arterial interval developed for i-STAT 1.

Reference intervals are provided only as a guideline. The most definitive reference intervals are those established for your patient population and using individualized patient trends. Test results should be interpreted in conjunction with the patient's clinical signs.

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www.zoetisUS.com/istatalinityv

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[1] Monnig AA. Practical Acid-Base in Veterinary Patients. Veterinary Clinics of North America: Small Animal Practice. 2013; 43: 1273-1286. doi:10.1016/j.cvsm.2013.07.009.
[2] George JW, Zabolotzky, SM. Water, Electrolytes, and Acid Base [Chapter 5]. Duncan & Prasse's Veterinary Laboratory Medicine. 2011: 147-150.
[3] Kerl ME. Acid-Base, Oximetry, and Blood Gas Analysis [Chapter 128]. Textbook of Veterinary Internal Medicine Expert Consult, Eighth Edition. 2016: 531-535.
[4] Flaherty D, Blackwood L. Blood gas analysis and acid-base disorders [Chapter 9]. BSAVA Manual of Canine and Feline Clinical Pathology, Third Edition. 2016: 169-171.
[5] Flaherty D, Blackwood L. Blood gas analysis and acid-base disorders [Chapter 9]. BSAVA Manual of Canine and Feline Clinical Pathology, Third Edition. 2016: 172-173.
[6] Data on File, Study report DH65R-US-19-084, Zoetis Inc., 2021. Arterial ranges for canine and feline reflect historical data and were not updated in this study.

For Cartridge & Test Information sheets, please visit: www.pointofcare.abbott

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