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.
- Venipuncture is 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, pCO₂, pO₂, TCO₂, 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](http://www.pointofcare.abbott)
Acid-base analysis is vital to your diagnostic protocols

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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>Measurement of the H⁺ ion concentration</td>
</tr>
<tr>
<td>pCO₂</td>
<td>Partial pressure of the carbon dioxide; reflects the amount of carbonic acid present</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>Bicarbonate, the body’s major buffer</td>
</tr>
<tr>
<td>Anion Gap</td>
<td>Represents the concentration of all unmeasured anions in the plasma; the difference between measured cations and measured anions (Na⁺ + K⁺)-(Cl⁻ + HCO₃⁻); helpful in determining the cause of acid-base abnormalities.</td>
</tr>
<tr>
<td>Base Excess</td>
<td>mEq/L of strong base or acid needed to return the pH to 7.40.</td>
</tr>
<tr>
<td>Electrolytes</td>
<td>Na⁺, K⁺, Cl⁻</td>
</tr>
<tr>
<td>TCO₂</td>
<td>Total carbon dioxide, which is primarily HCO₃⁻ (95%)</td>
</tr>
<tr>
<td>pO₂</td>
<td>Partial pressure of oxygen; measurement of the tension or pressure of oxygen dissolved in blood</td>
</tr>
</tbody>
</table>

Note: A venous sample is acceptable for interpretation of acid-base parameters. For detailed information on pO₂, an arterial sample is recommended.
Acid-Base Diagnostic Chart

**Step 1**
Determine whether the pH is high or low

**Step 2**
Determine the primary disturbance

**Step 3**
Determine whether there is metabolic or respiratory compensation

### Low pH: Acidemia
- pH < 7.35 (canine and equine)
- pH < 7.25 (feline)

### Normal
- pH 7.35 - 7.45 (canine and equine)
- pH 7.25 - 7.40 (feline)

### High pH: Alkalemia
- pH > 7.45 (canine and equine)
- pH > 7.40 (feline)

**Note:** With compensation, the pH may trend toward normal even in the presence of an acidosis.

**Mixed acidosis**
- HC03- Low
- pCO2 High

**Respiratory acidosis**
- pCO2 High

**Metabolic acidosis**
- HCO3- Low

**Organic acid accumulation**
- Renal failure
- Lactic acidosis
- Ketoacidosis
- Ethylene glycol toxicity

**Mixed metabolic acidosis**
- HCO3- Low and pCO2 High

**Anion gap**
- High

**Compensated metabolic acidosis**
- HCO3- Low and pCO2 High

**Compensated metabolic alkalosis**
- HCO3- High and pCO2 Low

**Respiratory alkalosis**
- pCO2 Low

**Metabolic alkalosis**
- pCO2 High

**Mixed alkalosis**
- pCO2 Normal

**Compensated metabolic alkalosis**
- HCO3- Normal

**Metabolic alkalosis**
- HCO3- High

**Upper GI obstruction**
- Iatrogenic (Sodium bicarbonate therapy)
- Medications (diuretics)

**Respiratory acidosis**
- pCO2 High

**Metabolic acidosis**
- pCO2 Low

**Organic acid accumulation**
- Renal failure
- Lactic acidosis
- Ketoacidosis
- Ethylene glycol toxicity

**Mixed metabolic acidosis**
- HCO3- Low and pCO2 High

**Anion gap**
- High

**Compensated metabolic acidosis**
- HCO3- Low and pCO2 High

**Compensated metabolic alkalosis**
- HCO3- High and pCO2 Low

**Respiratory alkalosis**
- pCO2 Low

**Metabolic alkalosis**
- pCO2 High

**Mixed alkalosis**
- pCO2 Normal

**Compensated metabolic alkalosis**
- HCO3- Normal
### Common Disease States Where Acid-Base Analysis Is Beneficial

#### Expected Acid-Base Abnormalities (depending on species)

<table>
<thead>
<tr>
<th>ACIDEMIA</th>
<th>ALKALEMAIA</th>
</tr>
</thead>
</table>
| pH < 7.35 (canine and equine)  
  pH < 7.25 (feline) | pH > 7.45 (canine and equine)  
  pH > 7.40 (feline) |

**Metabolic acidosis**
- $\text{H}^+ \quad \text{pH (Most common presentation)}$
- $\text{HCO}_3^- \quad \text{pH (rare in small animals)}$

**Respiratory alkalosis**
- $O_2 \quad \text{hyperventilation} \quad \text{pCO}_2 \quad \text{pH}$
- Reduced ability to uptake or exchange $O_2$

**Lactic Acidosis**
- 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)

**Vomiting/Diarrhea**
- Lactic acidosis secondary to hypovolemia
- +/- loss of sodium bicarbonate ($\text{NaHCO}_3$)
- Electrolyte abnormalities
- Anion gap often normal

**Renal Failure**
- Uremic toxins increase acid levels
- Loss of sodium bicarbonate ($\text{NaHCO}_3$) OR hydrogen ion retention ($\text{H}^+$)
- Electrolyte abnormalities
- Lactic acidosis with anemia and/or severe dehydration

**Diabetic Ketoacidosis**
- Ketoacids
- Lactic acidosis
- Electrolyte abnormalities
- High/noraml anion gap, depending on severity

**Upper GI Obstruction**
- Loss of Cl- in the form of HCl (hydrochloric acid)
- Hypochloremia is common
- Potential loss of free body water

**Respiratory**
- 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, pO₂, TCO₂**  
  Helpful with GDV and other severe GI cases  
  Diagnosis and monitoring for emergencies and/or severe cases

- **CG8+: Acid-base, pO₂, HCT, glucose, Na, K, iCa**  
  Helpful for monitoring diabetic and chronic kidney disease patients  
  Diagnosis and monitoring for emergencies and/or severe cases  
  Neoplasia diagnosis

- **EC8+: Acid-base, HCT, electrolytes**  
  (best if high anion gap expected)  
  Helpful in monitoring renal failure patients and GI disease

*Disclaimer: Cartridge examples are suggestions for diagnostics. Overall diagnosis 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.

<table>
<thead>
<tr>
<th>Hematology</th>
<th>CG4+</th>
<th>CG8+</th>
<th>G</th>
<th>Crea</th>
<th>E3+**</th>
<th>6+</th>
<th>CHEM8+</th>
<th>EC8+</th>
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</thead>
<tbody>
<tr>
<td>Hematocrit (Hct)</td>
<td>●</td>
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<td>●</td>
<td>●</td>
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<tr>
<td>Hemoglobin (Hb)*</td>
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<tr>
<td>Chemistry</td>
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<td>Blood Urea Nitrogen (BUN)</td>
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<td>Electrolytes</td>
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<td>Acid Base</td>
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<td>Anion Gap (AnGap)*</td>
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<td>Blood Gas</td>
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<tr>
<td>Lactate (Lac)</td>
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<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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</tbody>
</table>

*Calculated Value
**Chloride on the E3+ cartridge is only available for use on the VETSCAN i-STAT 1 and i-STAT Alinity v analyzers.
# i-STAT Alinity v System and Reference Ranges

<table>
<thead>
<tr>
<th></th>
<th>Units</th>
<th>System Range</th>
<th>Reference Range**</th>
<th>Canine</th>
<th>Feline</th>
<th>Equine</th>
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<tbody>
<tr>
<td><strong>Hematology</strong></td>
<td></td>
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<tr>
<td>Hematocrit (Hct)</td>
<td>% PCV</td>
<td>15 - 75</td>
<td>35 - 50</td>
<td>24 - 40</td>
<td>30 - 45</td>
<td></td>
</tr>
<tr>
<td>Hemoglobin (Hb)*</td>
<td>g/dL</td>
<td>5.1 - 25.5</td>
<td>12.0 - 17.0</td>
<td>8.0 - 13.0</td>
<td>10.0 - 15.0</td>
<td></td>
</tr>
<tr>
<td><strong>Chemistry</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Blood Urea Nitrogen (BUN)</td>
<td>mg/dL</td>
<td>3 - 140</td>
<td>10 - 26</td>
<td>15 - 34</td>
<td>11 - 27</td>
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<tr>
<td>Creatinine (Crea)</td>
<td>mg/dL</td>
<td>0.2 - 20.0</td>
<td>0.5 - 1.3</td>
<td>1.0 - 2.2</td>
<td>0.4 - 2.2</td>
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<tr>
<td>Ionized Calcium ([Ca])</td>
<td>mmol/L</td>
<td>0.25 - 2.50</td>
<td>1.12 - 1.40</td>
<td>1.20 - 1.32</td>
<td>1.25 - 1.75</td>
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<tr>
<td>Glucose (Glu)</td>
<td>mg/dL</td>
<td>20 - 700</td>
<td>60 - 115</td>
<td>60 - 130</td>
<td>62 - 134</td>
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<tr>
<td><strong>Electrolytes</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloride (Cl)</td>
<td>mmol/L</td>
<td>65 - 140</td>
<td>106 - 127</td>
<td>112 - 129</td>
<td>100 - 111</td>
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</tr>
<tr>
<td>Sodium (Na)</td>
<td>mmol/L</td>
<td>100 - 180</td>
<td>139 - 150</td>
<td>147 - 162</td>
<td>128 - 142</td>
<td></td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>mmol/L</td>
<td>2.0 - 9.0</td>
<td>3.4 - 4.9</td>
<td>2.9 - 4.2</td>
<td>1.9 - 4.1</td>
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<tr>
<td><strong>Acid-Base</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td></td>
<td>6.5 - 8.2</td>
<td>7.35 - 7.45</td>
<td>7.25 - 7.40</td>
<td>7.35 - 7.45</td>
<td></td>
</tr>
<tr>
<td>Partial Pressure of Carbon Dioxide (PCO₂)</td>
<td>mmHg</td>
<td>5 - 130</td>
<td>35.0 - 38.0</td>
<td>33.0 - 51.0</td>
<td>36.0 - 46.0</td>
<td></td>
</tr>
<tr>
<td>Bicarbonate (HCO₃) *</td>
<td>mmol/L</td>
<td>1.0 - 85.0</td>
<td>15.0 - 23.0</td>
<td>13.0 - 25.0</td>
<td>25.0 - 30.0</td>
<td></td>
</tr>
<tr>
<td>Total Carbon Dioxide (TCO₂)*</td>
<td>mmol/L</td>
<td>5 - 50</td>
<td>17 - 25</td>
<td>16 - 25</td>
<td>24 - 32</td>
<td></td>
</tr>
<tr>
<td>Anion Gap (AnGap)*</td>
<td>mmol/L</td>
<td>(-10) - (+99)</td>
<td>8 - 25</td>
<td>10 - 27</td>
<td>5 - 15</td>
<td></td>
</tr>
<tr>
<td>Base Excess (BE)*</td>
<td>mmol/L</td>
<td>(-30) - (+30)</td>
<td>(-5) - 0</td>
<td>(-5) - (+2)</td>
<td>(-5) - (+5)</td>
<td></td>
</tr>
<tr>
<td><strong>Blood Gas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partial Pressure of Oxygen (PO₂)</td>
<td>mmHg</td>
<td>5 - 800</td>
<td>85 - 100</td>
<td>90 - 110</td>
<td>90 - 110</td>
<td></td>
</tr>
<tr>
<td>Oxygen Saturation (sO₂)*</td>
<td>%</td>
<td>0 - 100</td>
<td>&gt;90</td>
<td>&gt;90</td>
<td>&gt;90</td>
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</tr>
<tr>
<td><strong>Specialty</strong></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Lactate (Lac)</td>
<td>mmol/L</td>
<td>0.30 - 20.00</td>
<td>0.6 - 2.9</td>
<td>0.5 - 2.7</td>
<td>0.3 - 1.5</td>
<td></td>
</tr>
</tbody>
</table>

*Calculated Value
**Reference ranges are for venous samples unless specified

Highlighted cells reflect ranges for arterial samples. No venous reference ranges are yet available.

These normal intervals are provided only as a guideline. The most definitive reference intervals are those established for your patient population. Test results should be interpreted in conjunction with the patient’s clinical signs.