



I-STAT Arterial Blood Gas (ABG) Testing Protocol

Summary:

Arterial blood gasses consisting of measured analytes (pH, PCO₂, PO₂) as well as calculated analytes (BE, HCO₃, TCO₂, sO₂) will be tested in the nursing facility at the bed side by Vista laboratory personnel. The testing will be performed on a hand held I-STAT device and utilize arterial blood. This blood will be collected by the respiratory therapist at the facility. After testing, the initial results will be printed on a tape generated by the I-STAT analyzer and given to the respiratory therapist for review. A final report will be generated at the laboratory and faxed to the nursing facility.

Procedure:

1. When an arterial blood gas (ABG) needs to be performed the Vista STAT line will be called (877-372-0673).
2. Phlebotomy personnel will be dispatched within a 2 hour maximum response time.
3. Vista phlebotomy personnel will bring all the equipment required to draw and run the ABG. The facility must supply a physician's order, a completed Vista requisition, and a copy of the patient's face sheet.
4. The respiratory therapist will draw the arterial specimen using a 22g x 1" needle attached to a 3 ml blood gas sampler syringe coated with balanced heparin.
5. Once the blood has been collected, the Vista laboratory phlebotomist will run the sample on the I-STAT analyzer.
6. The I-STAT generates a report that will be printed out and given to the respiratory therapist for review. Both the Vista phlebotomist and the respiratory therapist will sign off on the ABG result.
7. The phlebotomist performing the test will order the ABG in Copia and result the ABG in Harvest. The final official Vista report will be faxed to the facility.

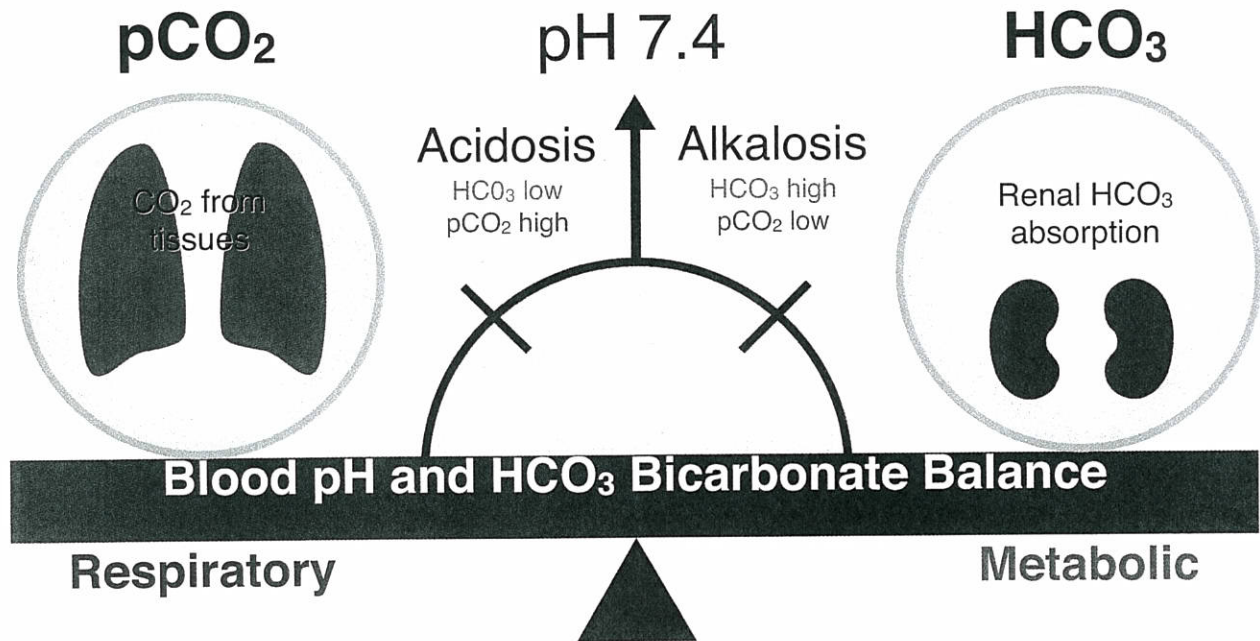
NOTE: CLIA and the AHCA require that the official Vista ABG report be completed and sent to the facility to be included in the patient's chart. This needs to be done within 24 hours of performing the ABG. A copy of all the paperwork needs to be sent to Kathy Jones at the Clermont Laboratory.

Blood Gas Basics

The body uses the lungs and kidneys to carefully regulate blood pH and maintain it within a narrow range of 7.35 - 7.45.

pH < less than 7.4 = **acidic**
pH > greater than 7.4 = **alkaline** or basic

CO₂ and its forms (bicarbonate HCO₃ and carbon dioxide pCO₂) are acidic.



Oxygen is brought into the body through the lungs and carried by hemoglobin inside the red cells to the tissues. The tissues deposit their waste products of carbon dioxide and bicarbonate back into the blood. The blood then takes bicarbonate to kidneys and carbon dioxide to the lungs to be excreted from the body. **How much carbon dioxide or bicarbonate the body excretes or reabsorbs is directly related to pH balance.**

Blood gases (ABGs) are the direct measurement of pH, pO₂ and pCO₂ in blood as well as calculated values HCO₃, tCO₂, BE and sO₂.

Blood Gas Basics

Test Name	Alternate Name	Brief Definition	Measured or Calculated
pH		How acidic or basic the blood is	Measured
pO₂ p = partial pressure	Oxygen	How much oxygen is in blood	Measured
pCO₂ p = partial pressure	Carbon Dioxide	How much carbon dioxide is in blood	Measured
HCO₃	Bicarbonate	Main form of carbon dioxide found in blood.	Calculated PH & pCO ₂ used for calculation
tCO₂ t = total	total carbon dioxide	How much bicarbonate and carbon dioxide are in blood.	Calculated PH & pCO ₂ used for calculation
BE	Base Excess	Amount of acid to be added or subtracted to the blood to return to normal PH	Calculated PH & pCO ₂ used for calculation
sO₂ s = saturation	Oxygen saturation	Percent of hemoglobin that is carrying oxygen.	Calculated pO ₂ used for calculation

Conditions and Causes

Condition	Results	Common Causes
Metabolic acidosis	PH = <7.4 HCO ₃ Low	Kidney Failure, Shock, diabetic ketoacidosis
Metabolic alkalosis	PH = >7.4 HCO ₃ High	Chronic vomiting, low potassium
Respiratory acidosis	PH = <7.4 pCO ₂ High	Lung disease, COPD
Respiratory alkalosis	PH = >7.4 pCO ₂ Low	Hyperventilation, pain, anxiety


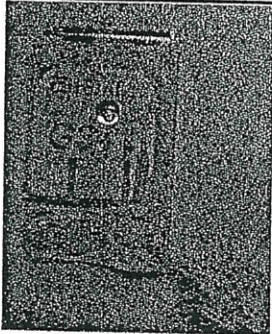
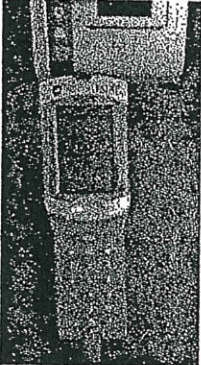
i-Stat Step by Step Guide

Electronic Simulator


Program the i-STAT	<ul style="list-style-type: none">• Press power button.• Press menu button until "Analyzer Function" screen appears.• Press # 3 "Quality Test".• Press # 4 "Simulator"• Follow prompts at top of screen.• Scan or Enter your operator ID.• Scan or Enter Simulator ID (on side of box)
Insert Simulator	<ul style="list-style-type: none">• Remove cap• Insert simulator into cartridge port
Results	<ul style="list-style-type: none">• Results will appear on screen• PASS displayed continue to use analyzer• FAIL displayed first time- repeat test.• FAIL X 2 DO NOT USE Contact Support

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Patient Testing

<p>Program the i-STAT</p>	<ul style="list-style-type: none"> • Press power button • Select #2 button (i-stat cartridge) • Follow prompts at top of screen • Enter your operator ID Last 4 Digits of SS# • Enter Patient ID (Vista #) <i>SS#</i> • Scan barcode on cartridge <i>Repeat</i> 	
<p>Apply Sample</p>	<ul style="list-style-type: none"> • Replace needle with sample application tip • Mix sample • Remove air bubbles • Discard at least 3 drops • Place sample tip into sample well • Dispense sample until it reaches the fill mark 	
<p>Close door</p>	<ul style="list-style-type: none"> • Close cover over sample well *avoid direct pressure on sample well* • Inspect Cartridge for air bubbles and correct fill. *If noted discard cartridge and repeat 	
<p>Insert Cartridge</p>	<ul style="list-style-type: none"> • Insert cartridge into port on bottom of analyzer. • Cartridge will click into place. 	
<p>Results</p>	<ul style="list-style-type: none"> • Results will appear on screen • Align printer and top of analyzer • Press Print button. Hold in place until finished printing. • Attach Copy to Sample Sheet • Have Respiratory Therapist sign • Operator sign • Make copy or repeat print and sign (must have two copies). 	

I-Stat Quick Notes

- Cartridges can only be touched on sides, bottom or area to left of sample well
- Cartridges must be at **room temp before use**
- Cartridges must be dated with new **2 month expiration date once removed from refrigerator. Do not re-refrigerate.**
- Menu button can be used as "home" key to back out of screens
- **Do Not remove** cartridge while "**Cartridge Locked**" is displayed on screen
- I-Stat uses two 9 volt lithium batteries or rechargeable battery
-  minute time window is opened once "Insert Cartridge" is displayed. Press scan key again if more time is needed
- **Check supply list** before leaving
- **Troubleshooting and Error Codes**
 - **Code 21** = Cartridge Preburst (caused by damage to center of cartridge reagent/calibrator bubbles)
 - **Code 31** = Unable to position sample (clot in sample or snap closure not sealed)
 - **Code 30/37** = Overfill (caused by direct pressure over sample well during door close)
 - **Code 35/36** = Under fill
 - **Flags**
 - **** = star out caused by sensor damage
 - > = above reportable range
 - < = below reportable range
 - <> = The result is dependent on another test that has been flagged. Any TCO₂ outside of reportable range will cause this flag on the other blood results.

- **Repeating test**

- If < less than 10 minutes from sample draw time
 - Remix sample
 - Repeat with new cartridge
- If > greater than 10 minutes from sample draw time
 - Redraw sample
 - Repeat with new cartridge

G3+	Expected Values		Reportable Range
	Arterial	Venous	
ph	7.35-7.45	7.31 - 7.41	6.50 -8.20
pCO2	35-45 mmHg	41-51 mmhg	5 - 130 mmHg
pO2	80-105 mmHg		5 - 800 mmHg
*tCO2	23-27 mmol/L	24-29 mmo/L	5 - 50 mmo/L
*HCO3	22-26 mmol/L	23-28 mmol/L	1.0 - 85.0 mmo/L
*Base Excess (BE)	(-2) -(+3) mmol/L	(-2)-(+3) mmol/L	(-30) - (+30)
*sO2	95-98%	75% or less	