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**Lab Dept:** Chemistry

**Test Name:** VENOUS BLOOD GAS (VBG)

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***General Information***

**Lab Order Codes:** VBG

**Synonyms:** Venous blood gas

**CPT Codes:** 82803 - Gases, blood, any combination of pH, pCO<sub>2</sub>, pO<sub>2</sub>, CO<sub>2</sub>, HCO<sub>3</sub> (including calculated O<sub>2</sub> saturation)

**Test Includes:** VpH (no units), VpCO<sub>2</sub> and VpO<sub>2</sub> measured in mmHg, VsO<sub>2</sub> and VO<sub>2</sub>AD measured in %, HCO<sub>3</sub> and BE measured in mmol/L, Temperature (degrees C) and ST (specimen type)

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***Logistics***

**Test Indications:** Useful for evaluating oxygen and carbon dioxide gas exchange; respiratory function, including hypoxia; and acid/base balance. It is also useful in assessment of asthma; chronic obstructive pulmonary disease and other types of lung disease; embolism, including fat embolism; and coronary artery disease.

**Lab Testing Sections:** Chemistry

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 30 minutes

**Special Instructions:** See [Collection](#) and [Patient Preparation](#)

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***Specimen***

**Specimen Type:** Whole blood

**Container:** **Preferred:** Sims Portex® syringe (PB151) or Smooth-E syringe (956-463)

**Draw Volume:** 0.4 mL (Minimum: 0.2 mL) blood

Note: Submission of 0.2 mL of blood does not allow for repeat analysis.

**Processed Volume:** 0.2 mL blood per analysis

**Collection:** Avoid using a tourniquet. Anaerobically collect blood into a heparinized blood gas syringe (See [Container](#)). Once the puncture has been performed or the line specimen drawn, **immediately** remove all air from the syringe. Remove the needle, cap tightly and gently mix. **Do not expose the specimen to air.** Forward the specimen immediately at ambient temperature. Specimens cannot be stored.

Note: When drawing from an indwelling catheter, the line must be thoroughly flushed with blood before drawing the sample.

**Special Processing:** Lab Staff: Deliver the specimen to the blood gas testing station. Testing must be completed within 30 minutes of collection or the sample should be immersed in an ice bath as soon as possible for delayed processing.

**Patient Preparation:** The patient should be in a relaxed and steady state. Anxiety or hyperventilation will affect results.

**Sample Rejection:** Clotted sample; mislabeled or unlabeled sample; sample containing air

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### ***Interpretive***

**Reference Range:**

<b>VO2 Saturation:</b>	~75%
<b>VpO2:</b>	30 - 50 mm Hg
<b>VpCO2:</b>	40 – 52 mm Hg
<b>VpH:</b>	7.31 – 7.41
<b>HCO3:</b>	22 – 27 mEq/L
<b>Base Excess (BE):</b>	
Newborn (0-7 days):	-10 to -2 mmol/L
Infant (1 week-1 year):	-7 to -1 mmol/L
Child (1-16 years):	-4 to +2 mmol/L
Adult (>16 years):	-3 to +3 mmol/L

**Critical Values:** VpCO2: <15 or >70 mm Hg

VpH: <7.2 or >7.6

**Limitations:** N/A

**Methodology:**

Ion-Selective Electrode, HCO<sub>3</sub> and BE by calculation

**References:**

Tietz, Norbert (1999) Clinical Guide to Laboratory Tests, 3<sup>rd</sup> edition, WB Saunders Co

ABL800 FLEX Operator's Manual from software version 6.00,  
Publication: 201410, Edition: E, Code number: 994-909,  
[www.radiometer.com](http://www.radiometer.com)

Jacobs & DeMott Laboratory Test Handbook (2001) Lexi-Comp, Inc,  
Hudson, OH, 5th Edition

ABL90 Flex Operator's Manual – from software Version 3.1xx  
Publication 201403 Edition H Code: 995-656

**Update:**

7/14/2005: Added clarification on draw volume for repeat analysis.  
6/11/2018: Updated references