Lab Dept: Chemistry

Test Name: CAPILLARY BLOOD GAS (CBG)

**General Information**

Lab Order Codes: CBG

Synonyms: CBG

CPT Codes: 82803 – Gases, blood, any combination of pH, pCO2,pO2, CO2, HCO3 (including calculated O2 saturation)

Test Includes: pH (no units), pCO2 measured in mmHg, HCO3 and BE measured in mmol/L, Temperature (°C) and ST (specimen type)

**Logistics**

Test Indications: Capillary blood gas determinations are useful in monitoring neonates or other patients when arterial collection is not practical. Arteriolization of the capillary bed yields pH and pCO2 comparable to arterial blood. 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.

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

**Specimen**

Specimen Type: Whole blood

Container: Lithium Heparinized Capillary blood gas tube tightly capped with internal mixing flea.
**Draw Volume:**
MIN campus: 0.14 mL (Minimum: 0.07 mL) blood  
STP campus: 0.2 mL (Minimum: 0.1 mL) blood

Note: Submission of 0.1 mL of blood in one capillary tube does not allow for repeat analysis.

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

**Collection:**
Perform a capillary puncture from an arteriolized site. Fill 2 capillary tubes completely without introducing air bubbles. Cap both ends and mix 20 times by gentle inversion. Forward immediately at ambient temperature only. **Do not** expose the specimen to air.

Do not mix capillary samples from neonates with a magnet. Use gentle and thorough inversion only.

**Special Processing:**
Lab Staff: Deliver the specimen to the blood gas testing station. Testing should be completed within 15 minutes of collection.

**Patient Preparation:**
The skin area to be punctured should be warmed to no more than 42°C for 3-10 minutes by applying an infant heel warmer. The patient should be in a relaxed and steady state

**Sample Rejection:**
Clotted specimen; unlabeled specimen or mislabeled specimens; specimens >30 minutes old; specimen contaminated with large air bubbles

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**Interpretive**

<table>
<thead>
<tr>
<th><strong>Reference Range:</strong></th>
<th><strong>pH:</strong></th>
<th>7.35 – 7.45</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PCO2:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males:</td>
<td>35 – 48 mm Hg</td>
<td></td>
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<tr>
<td>Females:</td>
<td>32 – 45 mm Hg</td>
<td></td>
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<tr>
<td>HCO3:</td>
<td>22 – 27 mEq/L</td>
<td></td>
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</tbody>
</table>

**Base Excess:**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Range</th>
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<tbody>
<tr>
<td>Newborn (0 – 7 days):</td>
<td>-10 to -2 mmol/L</td>
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<tr>
<td>Infant (1 week – 1 year):</td>
<td>-7 to -1 mmol/L</td>
</tr>
<tr>
<td>Child (1 – 16 years):</td>
<td>-4 to +2 mmol/L</td>
</tr>
<tr>
<td>Adult (&gt;16 years):</td>
<td>-3 to +3 mmol/L</td>
</tr>
</tbody>
</table>
Critical Values:

- pCO2: <15 or >70 mm Hg
- pH: <7.2 or >7.6

Limitations:

- N/A

Methodology:

- Ion-Selective Electrode, HCO3 and BE by calculation

References:


Update:

- 7/14/2005: Added clarification on draw volume for repeat analysis.
- 4/22/2010: TAT update, previously listed as 1 hour, updated references