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**Lab Dept:** Chemistry

**Test Name:** PROCALCITONIN

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***General Information***

**Lab Order Codes:** PROCA

**Synonyms:** PCT; PROCL

**CPT Codes:** 84145 – Procalcitonin (PCT)

**Test Includes:** Procalcitonin concentration measured in ng/mL.

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***Logistics***

**Test Indications:** Useful for diagnosis of bacteremia and septicemia in adults and children (including neonates); Diagnosis of renal involvement in urinary tract infection in children; Diagnosis of bacterial infection in neutropenic patients; Diagnosis, risk stratification, and monitoring of septic shock; Diagnosis of systemic secondary infection post-surgery, and in severe trauma, burns, and multiorgan failure; Differential diagnosis of bacterial versus viral meningitis; Differential diagnosis of community-acquired bacterial versus viral pneumonia; Monitoring of therapeutic response to antibacterial therapy.

**Lab Testing Sections:** Chemistry (Performed on the Minneapolis campus)

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

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** Performed daily (Stat: 1-2 hours)

**Special Instructions:** N/A

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***Specimen***

**Specimen Type:** Blood

**Container:** Green top (Li heparin) tube, **preferred**

Alternate tube: Red, marble or gold top or lavender (EDTA) tube

**Draw Volume:** 1 mL (Minimum: 0.5 mL) blood

**Processed Volume:** 0.3 mL (Minimum: 0.15 mL) plasma/serum

**Collection:** Routine blood collection. Mix tubes containing anticoagulant by gentle inversion.

**Special Processing:** Lab Staff: Centrifuge specimen, remove plasma/serum aliquot into a screw-capped round bottom plastic via. Store at refrigerated temperatures. Do not exceed 8 hours on clot/cells/gel or 24 hours off clot/cells/gel at room temperature.

**Patient Preparation:** None

**Sample Rejection:** Mislabeled or unlabeled specimens; gross hemolysis

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***Interpretive***

**Reference Range:**

Age	Range (ng/mL)
<b>Newborns:</b>	
0 – 6 hours	< or = 2
6 – 12 hours	< or = 8
12 – 18 hours	< or = 15
18 – 30 hours	< or = 21
30 – 36 hours	< or = 15
36 – 42 hours	< or = 8
42 – 48 hours	< or = 2
<b>Infants &gt;48 hours – Adult:</b>	
Infants >48 hours – Adult:	<0.1 ng/mL
<b>Interpretation – General Considerations:</b>	
Procalcitonin level <0.10 ng/mL: No systematic inflammatory response.	

<p>Procalcitonin level 0.10 – 0.49 ng/mL:</p> <p>Minor or no significant inflammatory response. Local inflammation and local infection are possible.</p>
<p>Procalcitonin level 0.50 – 1.99 ng/mL:</p> <p>Moderate risk for progression to severe systemic infection (Severe Sepsis).</p> <p>Patient should be closely monitored clinically, and retested if indicated. Note: Increased PCT levels are not always related to infection. Increases may also be seen in:</p> <ul style="list-style-type: none"> <li>● First days after major trauma, major surgery, severe burns, treatment with drugs that stimulate release of pro-inflammatory cytokines.</li> <li>● Patients with invasive fungal infections and acute infection with plasmodium falciparum malaria.</li> <li>● Prolonged or severe cardiogenic shock, prolonged severe organ perfusion anomalies, small cell lung cancer, and medullary C-cell carcinoma of the thyroid.</li> </ul>
<p>Procalcitonin level 2.00 – 9.99 ng/mL:</p> <p>Severe systemic inflammatory response, most likely due to sepsis, unless other causes are known. High risk for progression to severe systemic infection.</p>
<p>Procalcitonin level &gt; or = 10.00 ng/mL:</p> <p><b>HIGH LIKELIHOOD OF SEVERE SEPSIS OR SEPTIC SHOCK.</b> Procalcitonin levels &gt;10ng/ml are almost exclusively due to severe bacterial sepsis or septic shock.</p>

**Critical Values:**

N/A

**Limitations:**

PCT can be elevated by non-infectious causes. These include, but are not limited to:

- Neonates < 48 hours of life (physiological elevation)
- The first days after a major trauma, major surgical intervention including extracorporeal circulation (ECMO), severe burns
- Treatment with OKT3 antibodies, interleukins, TNF-a and other drugs stimulating the release of pro-inflammatory cytokines
- Patients with invasive fungal infections, acute attacks of plasmodium falciparum malaria
- Patients with prolonged or severe cardiogenic shock, prolonged severe organ perfusion anomalies, small cell lung carcinoma or bronchial carcinoid, medullary C-cell carcinoma of the thyroid, Child-Pugh Class C liver cirrhosis, and peritoneal dialysis treatment.

**Low PCT levels do not automatically exclude the presence of bacterial infection.**

Such low levels may be obtained during the early course of infections, in

localized infections and subacute endocarditis. Therefore, follow-up and reevaluation of PCT in clinical suspicion of infection is pivotal.

Architect BRAHMS PCT results should not be used interchangeably with other methods for PCT determinations for monitoring patients.

The same sample matrix/tube type should be used for patient testing throughout admission due to variations in measurement (i.e. lithium heparin plasma, all serum, etc).

**Methodology:**

Chemiluminescent Microparticle Immunoassay

**References:**

Abbott Architect B.R.A.H.M.S PCT package insert, Revised June 2017, Ref B1-0601/R01, Abbott Laboratories, Abbott Park, IL 60064 USA

Chiesa, C., et. al (1998). Reliability of procalcitonin concentrations for the diagnosis of sepsis in critically ill neonates. *Clinical Infectious Diseases*, 26, 664-72

The Children's Hospital, Aurora, CO. PCT result comments 10/2009.

[Mayo Medical Laboratories](#) April 2018

**Updates:**

3/25/2014: Removal of critical value, previously listed as  $\geq 2.00$  ng/mL

2/9/2016: Update alt tube type

4/24/2018: Testing moved from Esoterix to internal test at Children's MN. Method and ref range update.