



## Memorandum –revised 9/14/15

**To:** QMC Physicians and Nursing Staff

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**Subject:** Procalcitonin (PCT) testing

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Procalcitonin is the prohormone of calcitonin and is secreted by different cell types in response to proinflammatory stimulation. An increase in the serum concentration of procalcitonin (PCT) indicates activation of the immune system as a consequence of bacterial, malarial, or some fungal infections. The use of PCT as a biomarker can discriminate between bacterial infection, viral infection, or other causes of inflammatory activity. Critical risk assessment of seriously ill patients admitted to the ICU for sepsis and septic shock is currently supported by PCT testing. PCT is performed using the Enzyme-Linked Fluorescent Assay (ELFA) on the VIDAS Brahms PCT Assay platform. A PCT concentration  $\geq 0.1$  ng/mL most likely indicates a clinically relevant bacterial infection and a PCT value of  $> 0.5$  ng/mL most likely indicates that the patient may be at a higher risk for developing severe sepsis or septic shock. The following table may serve a useful guide for PCT interpretations in conjunction with bacterial and viral testing.

Bacterial Pathogen Detected	Viral Pathogen Detected	Procalcitonin (ng/ml)	Interpretation
No	No	$\leq 0.05$	No evidence of bacterial or viral infection
No	No	0.5 - 1,000	Suspicious for nonculturable bacteria
No	Yes	$\leq 0.05$	Viral infection
No	Yes	0.25 - 1,000	Bacterial (nonculturable) and viral co-infection
Yes	Yes	0.25 - 1,000	Bacterial and viral co-infection
Yes	No	$\leq 0.05$	Bacterial colonization suspected
Yes	Yes	$\leq 0.05$	Bacterial colonization suspected and viral infection

In select cases (e.g. newborns, polytrauma, burns, major surgery, prolonged or severe cardiogenic shock), PCT elevation may not reflect the severity of infection. In addition, PCT is a laboratory test aid and should always be used and interpreted in conjunction with the patient's history, clinical assessments, and other laboratory findings.

Please refer questions to DLS Client Services (589-5101), Dr. Matthew J. Bankowski (589-5242) or Dr. Wesley Kim (589-5131).

Test Name	Order Code	Specimen Requirement	Specimen Rejection	CPT
Procalcitonin	6008	Lithium Heparin PST (Green)	Hemolyzed, icteric, lipemic, contaminated, specimen older than stability limits	84145

### References

1. **Becker, K. L., R. Snider, and E. S. Nylén.** 2008. Procalcitonin assay in systemic inflammation, infection, and sepsis: clinical utility and limitations. *Crit Care Med* **36**:941-952.
2. **Christ-Crain, M., and B. Müller.** 2007. Biomarkers in respiratory tract infections: diagnostic guides to antibiotic prescription, prognostic markers and mediators. *The European respiratory journal : official journal of the European Society for Clinical Respiratory Physiology* **30**:556-573.
3. **Gilbert, D. N.** 2011. Procalcitonin as a biomarker in respiratory tract infection. *Clin Infect Dis* **52 Suppl 4**:S346-350.
4. **Gilbert, D. N.** 2010. Use of plasma procalcitonin levels as an adjunct to clinical microbiology. *J Clin Microbiol* **48**:2325-2329.
5. **Schuetz, P., M. Christ-Crain, and B. Müller.** 2007. Biomarkers to improve diagnostic and prognostic accuracy in systemic infections. *Current opinion in critical care* **13**:578-585.