

► LAB ALERT ◀

Starting January 6, 2015, The Pathology Center will begin in-house testing for procalcitonin (PCT). PCT has been evaluated as a biomarker to assist the clinician in the diagnosis and treatment of bacterial infection.

Serum concentrations of PCT are normally <0.1 ng/ml. With systemic inflammation, particularly bacterial infection, it is produced in large quantities by many body tissues. PCT is detectable within 2-4 hours of onset of inflammation, peaks within 6-24 hours, is not impaired by neutropenia or other immunosuppressive states and levels parallel the severity of the inflammatory response.

Clinical uses advocated include:

- Diagnosis, risk stratification, and monitoring of septic shock
- Differential diagnosis of bacterial versus viral meningitis
- Determination of length of antibiotic therapy in respiratory infections and sepsis
- Differential diagnosis of community-acquired bacterial versus viral pneumonia
- Diagnosis of renal involvement in febrile urinary tract infection
- Diagnosis of bacterial infection in neutropenic patients

PCT should be used embedded in clinical algorithms adapted to the type of infection, the clinical context and setting. Decisions regarding antimicrobial therapy should not be based solely on PCT serum concentrations. If antibiotics are administered for lower respiratory tract infection (LRTI), repeat PCT testing is recommended every 2-3 days to consider early antibiotic cessation. It is recommended that patients admitted to the ICU with presumed sepsis/septic shock/etc. have PCT drawn on admission and that PCT be repeated daily on the next 2 days. Decisions regarding antibiotic therapy can then be made based upon PCT dynamics, culture data, and patient specific clinical data. Further PCT values may be drawn at the discretion of the physician. PCT is a dynamic biomarker and most useful when trends are analyzed over time and correlated with other clinical data.

While for some types of infections and clinical settings optimal PCT cut-offs have been established, for other types of infection PCT testing may be unhelpful. PCT levels do not rise with localized infections (e.g. osteomyelitis, localized abscess etc.), and negative PCT should not be used to rule out a localized infection. Nonbacterial causes of elevated PCT include: massive stress (i.e. severe trauma, burns, surgery, cardiac shock), certain chemotherapy drugs, malaria and some fungal infections, some forms of vasculitis, graft-versus-host disease, some paraneoplastic syndromes, significantly compromised renal function.

SPECIMEN: 0.5ml heparinized plasma (preferred) or serum, minimum 0.3ml.
Store refrigerated and transport to the lab within 48 hours.
Turnaround time: 2 hours

Reference Ranges and Clinical Use Algorithms:

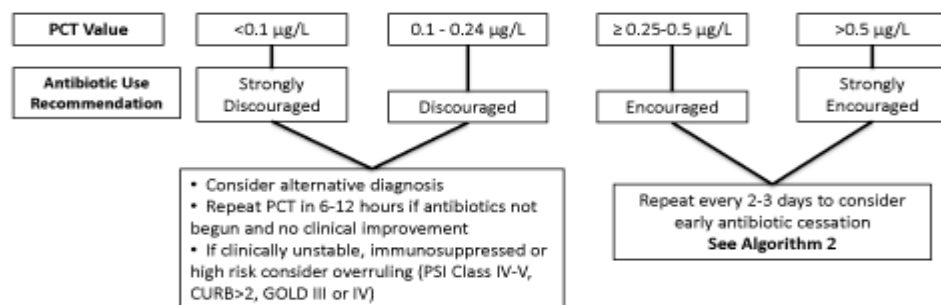
Newborns (0-48h)

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

Adults and infants >48 hours: <0.1 ng/mL

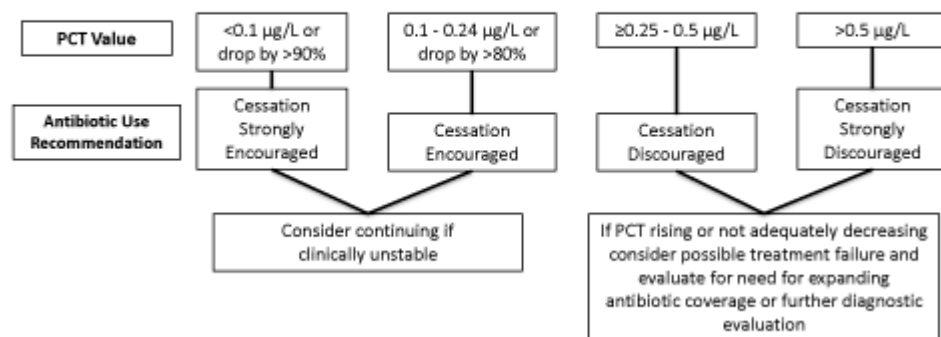
Algorithm 1: LRTI Initial PCT Value

LRTI Initial Antibiotic Use Algorithm



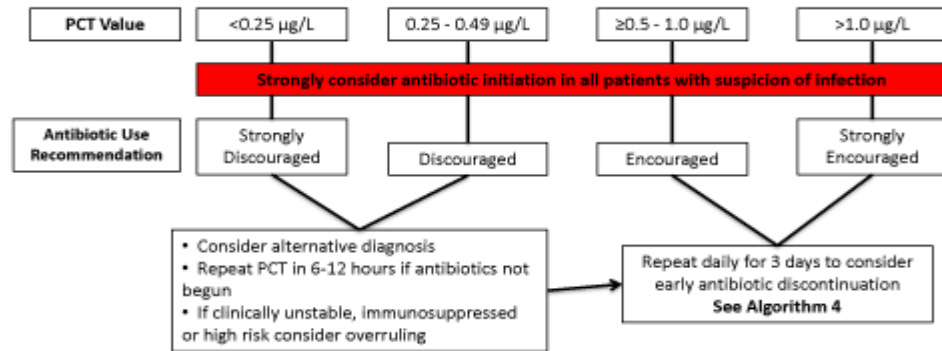
Algorithm 2: LRTI PCT Value Follow Up

LRTI PCT Follow up Algorithm



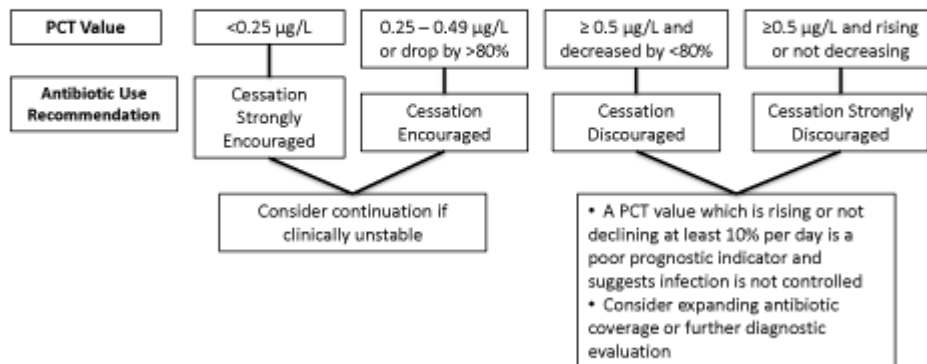
Algorithm 3: Sepsis Initial PCT Value

Sepsis Initial Antibiotic Use Algorithm



Algorithm 4: Sepsis PCT Follow Up

Sepsis Follow PCT Antibiotic Use Algorithm



REFERENCES:

1. Philipp Schuetz, Werner Albrich and Beat Mueller, *Procalcitonin for diagnosis of infection and guide to antibiotic decisions: past, present and future*, BMC Medicine 2011, 9:107
2. *Guide for the Clinical Use of Procalcitonin (PCT) In Diagnosis and Monitoring of Sepsis*, BRAHMS.

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