SBUH Procalcitonin Testing and Interpretation Guidelines

Situations where a serum procalcitonin (PCT) may be helpful:

- Differentiation of bacterial versus viral infections
- Determination of antibiotic treatment length in systemic infections
- Diagnosis, risk stratification, and monitoring of sepsis and septic shock
- Monitoring response to antibacterial therapy

Procalcitonin can be used to assist clinicians in the diagnosis of systemic infections and to support antibiotic therapy decisions.

Procalcitonin should not be used as the sole determinate for antimicrobial therapy. Results of the procalcitonin test should be placed in the context of the clinical scenario considering the possible site of infection, the likelihood of bacterial infection, the severity of illness, and other pertinent clinical data.

Do not withhold empiric antibiotic treatment when the clinical suspicion of bacterial infection is high, pending procalcitonin results or if the first procalcitonin is negative.

General Interpretation of PCT (Algorithms below)

Normal:	<0.1 ng/mL	
Suspected Lower Respiratory Tract Infection:		
	0.1-0.25 ng/mL – low likelihood for bacterial infection	Antibiotics discouraged
	>0.25 ng/mL – increased likelihood for bacterial infection	Antibiotics encouraged
Sepsis: *Strongly consider initiating antibiotics in all unstable patients with clinical suspicion of infection*		
	0.1-0.5 ng/mL – low likelihood for bacterial infection	Antibiotics discouraged
	>0.5 ng/mL – increased likelihood for bacterial infection	Antibiotics encouraged
	>2.0 ng/mL – high risk for sepsis/septic shock	Antibiotics strongly encouraged

Situations where PCT elevations may be due to a non-bacterial cause

- Massive stress (severe trauma, surgery, cardiac shock, burns)
- Treatment with agents that stimulate cytokines (OKT3, anti-lymphocyte globulins, IL-2, alemtuzumab)
- Malaria and some fungal infections
- Prolonged, severe cardiogenic shock or organ perfusion abnormalities
- Some forms of vasculitis and acute graft vs. host disease
- Paraneoplastic syndromes due to medullary thyroid and small cell lung cancer
- Significantly compromised renal function, especially ESRD/hemodialysis

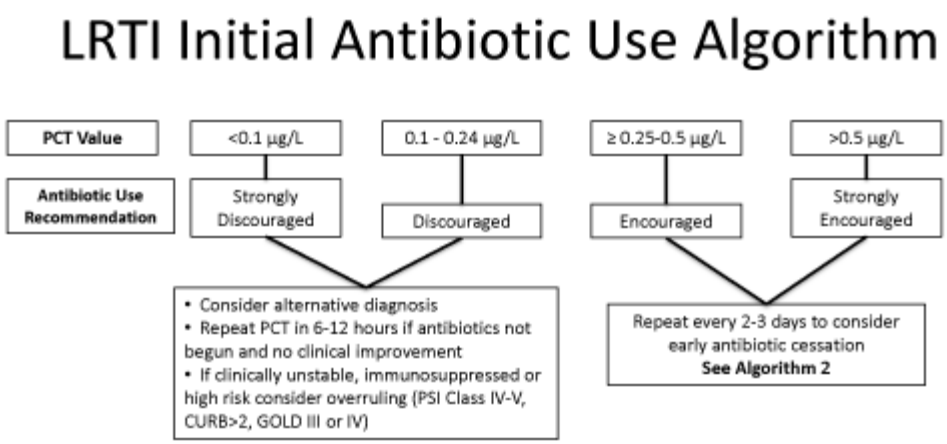
Situations where PCT may not be elevated in a bacterial infection (localized, non systemic)

- Localized infection (osteomyelitis, skin and soft tissue infections, abscess)
- Urinary tract infection without pyelonephritis

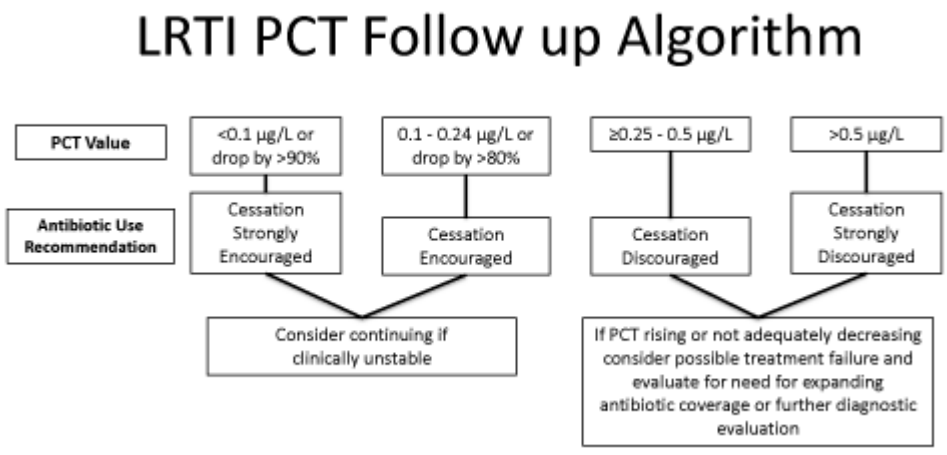
Lower respiratory tract infection (pneumonia, COPD exacerbation, bronchitis)

There is strong evidence to support the use of PCT in patients considered at risk for bacterial lower respiratory tract infection (LRTI) or being started on antibiotic for LRTI. PCT should be measured on admission and every 2-3 days subsequently. Interpretation of values is shown in the following algorithms:

Algorithm 1: LTRI initial PCT value



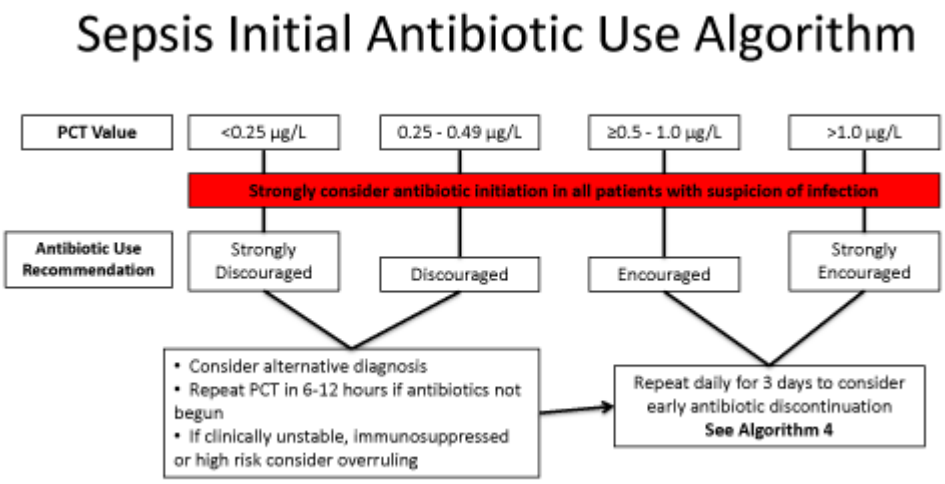
Algorithm 2: LRTI PCT Value Follow up



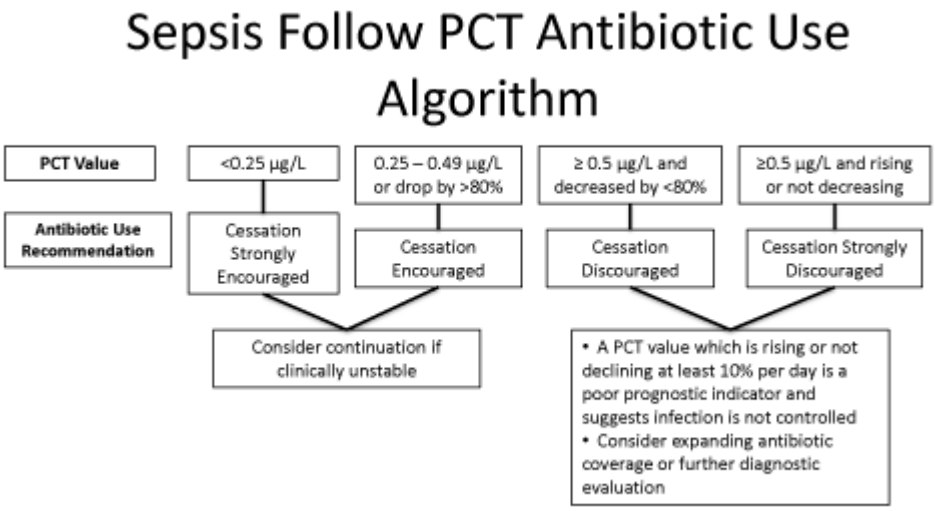
Sepsis/ICU Admission

Evidence supports the practice that patients admitted to the ICU with presumed sepsis or septic shock have PCT drawn on admission and in the next two days. Antimicrobial decisions can be made based on the PCT dynamics (see algorithms below) and other clinical data. Further PCT testing may be performed at the discretion of the clinician.

Algorithm 3: Sepsis Initial PCT Value



Algorithm 4: Sepsis PCT Follow Up



Adapted from http://www.nebraskamed.com/careers/education-programs/asp/procalcitonin-pct-guidance