Interpretative Information

Analyte: Procalcitonin (PCT)

Reference Interval (1):

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| Procalcitonin | ng/mL |
| 97.5th Percentile  | <0.07 |

Reference Interval (2):

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| Neonates Age (h) | Procalcitonin (ng/mL) |
| 0 - 6 h | ≤2 |
| 6 - 12 h | ≤8 |
| 12 - 18 h | ≤15 |
| 18 - 30 h | ≤21 |
| 30 - 36 h | ≤15 |
| 36 - 42 h | ≤8 |
| 42 - 48 h | ≤2 |
| <48 - <72 h | ≤0.15 |
| ≥72 h | ≤0.1 |

Comments:

PCT levels on newborns suffering from early sepsis are significantly higher than those of noninfected newborns when reference ranges by hours of age are used (2). Adult levels should apply at 72 hours or more after birth.

PCT concentrations rise rapidly (within 6-12 hour) after an infectious bacterial insult with systemic consequences.

Procalcitonin levels >10ng/ml are almost exclusively due to severe bacterial sepsis or septic shock.

PCT secretion parallels the severity of the inflammatory insult, with higher concentrations associated with more severe disease and declining concentrations with resolution of illness.

In the absence of an ongoing stimulus, PCT is eliminated with a half-life of 24 hours.

Increased PCT levels may not always be related to systemic infection.

Rheumatoid factor (RF) in human serum can react with reagent immunoglobulins, interfering with in vitro immunoassays.

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| **Risk assessment for progression to severe sepsis and septic shock** |
| PCT Result | Interpretation |
| > 2.0 ng/mL | High risk for progression to severe sepsis and/or septic shock |
| < 0.5 ng/mL | Low risk for progression to severe sepsis and/or septic shock |
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| **Prediction of cumulative 28-day mortality in patients with severe sepsis and septic shock** |
| ΔPCTmortality (Change in PCT(%)) = ((PCTDay 0 (or Day 1) – PCT(Day 4) )/PCTDay 0 (or Day 1))x100 |
| ΔPCT ≤ 80% | Higher risk for 28-day all-cause mortality of patients diagnosed with severe sepsis or septic shock |
| ΔPCT > 80% | Lower risk for 28- day all-cause mortality of patients diagnosed with severe sepsis or septic shock |
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| **Decision making on antibiotic therapy for patients with suspected or confirmed LRTI Initiation** |
| PCT Result | Interpretation |
| < 0.10 ng/mL | Antibiotic therapy strongly discouraged. |
| 0.10-0.25 ng/mL | Antibiotic therapy discouraged |
| 0.26-0.50 ng/mL | Antibiotic therapy encouraged. |
| > 0.50 ng/mL | Antibiotic therapy strongly encouraged. |
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| Follow-Up |
| Antibiotic therapy should be considered regardless of PCT result if the patient is clinically unstable, is at high risk for adverse outcome, has strong evidence of bacterial pathogen, or the clinical context indicates antibiotic therapy is warranted.  |
| If antibiotics are withheld, reassess if symptoms persist/worsen and/or repeat PCT measurement within 6–24 hours. |
| In order to assess treatment success and to support a decision to discontinue antibiotic therapy, follow-up samples should be tested once every 1–2 days, based upon physician discretion taking into account patient’s evolution and progress. |
| Antibiotic therapy may be adjusted using the discontinuation table. |
| **Decision making on antibiotic discontinuation for patients with suspected or confirmed LRTI Initiation** |
| Antibiotic therapy may be discontinued if the PCTCurrent is ≤ 0.25 ng/mL or if the ΔPCT is > 80%. |
| ΔPCTdiscontinuation (%)= ((PCTPeak – PCTCurrent ) / PCTPeak) x 100 |
| Follow-Up |
| Antibiotic therapy may be continued based upon other clinical findings, such as apparent progression on chest x-ray or ongoing/increasing toxicity. |
| If clinical picture has not improved and PCT remains high, reevaluate and consider treatment failure or other causes. |
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| **Decision making on antibiotic discontinuation for suspected or confirmed septic patients** |
| Antibiotic therapy may be discontinued if the PCTCurrent is ≤ 0.50 ng/mL or if the ΔPCT is > 80%. |
| ΔPCTdiscontinuation (%)= ((PCTPeak – PCTCurrent ) / PCTPeak) x 100 |
| Follow-Up |
| Antibiotic therapy may be continued based upon other clinical findings, such as apparent progression on chest x-ray or ongoing/increasing toxicity. |
| If clinical picture has not improved and PCT remains high, reevaluate and consider treatment failure or other causes. |

References

1. Abbott Alinity -c B∙R∙A∙H∙M∙S PCT Product Insert (G99806R01)
2. Chiesa C, Panero A, Rossi N, et al. Reliability of procalcitonin concentrations for the diagnosis of sepsis in critically ill neonates. Clin Infect Dis. 1998;26(3):664-672.