

Theophylline

Description	Theophylline is a bronchodilator used to treat patients with asthma, apnoea and other obstructive lung diseases.
Indication	Therapeutic drug monitoring.
Additional Info	<p>Theophylline monitoring is essential since individuals can vary in their rates of theophylline clearance.</p> <p>Theophylline elimination is slowed in patients who are obese, have hepatic disease and those on a high carbohydrate, low protein diet. Premature infants have very low rates of theophylline elimination. Conversely, cigarette smokers display a greater elimination rate.</p> <p>Theophylline may have an additive effect when used in conjunction with small doses of beta₂ agonists, which may increase side effects, including hypokalaemia.</p>
Concurrent Tests	Serum potassium.
Dietary Requirements	N/A
Interpretation	<p>The therapeutic range for theophylline is 10.0-20.0 mg/L (National Pathology Harmony 2011) in a pre-dose serum/plasma sample. The half-life is 3-13 hours and the time to reach steady state is 2-3 days.</p> <p>Recommended sampling times are as follows: For oral doses: pre-dose or at least 2-4 hours post dose. For IV doses: at least 6 hours into a 24 hour infusion.</p>
Collection Conditions	Plain serum sample required (Sarstedt white top tube).
Frequency of testing	<p>Measure 2 days after dosage change during initial dose optimisation on oral regimes. Measure earlier if patient is a smoker.</p> <p>Measure daily if on i.v. therapy.</p> <p>Measure every 4 hours in theophylline overdose requiring haemodialysis.</p> <p>As required from then on.</p>