Theophylline

General	
• Class of the drug:	Bronchodilators
• Synonym(s):	
• Common trade name(s) in Switzerland:	Euphyllin N®, Unifyl Continus®
• Conversion factors:	*mg/l x 5.55 = µmol/l* *µmol/l x 0.180 = mg/l*
Clinical pharmacology	
• Indications for TDM:	Individual dose adaptation, verification of compliance, side effects, suspicion of toxicity
• Protein binding:	60% (40% in newborns)
• Elimination half-life:	4-9 h (3-5h for children <12 years old; 30h for newborns)
• Volume of distribution:	0.5l/kg
• Metabolism:	
- Main metabolic pathways:	Oxidation and N-demethylation to 3-methylxanthine and 1,3-dimethyluric acid (CYP1A2, CYP2E1)
- Active metabolite(s)?	3-methylxanthine (20-50% activity of theophyllin), caffeine in newborns
- Inhibitor or inducer of the cytochrome P450 system?	No
- Other significant pharmacokinetic interactions:	Increased metabolism in smokers
• Elimination of parent drug:	Hepatic > 87% Renal < 10% (greater in newborn)
• Typical therapeutic range:	10-20 mg/l (55.5-111 µmol/l)
• Potentially toxic concentration:	>20 mg/l (> 111 µmol/l)
Pre-analytics	
• Time to steady-state since beginning of treatment or change of posology:	2-3 days (adults), 1-2 days (children), 1-5 days (infants), 5 days (newborns)
• Time for blood sampling:	Before next dose at steady-state
• Type(s) of sample:	Serum or plasma
• Stability:	3 months at 25°C

Analytics	
• Position(s) in the analysis list/Method:	8543.00 all methods
Remarks	None
References	• *Arzneimittelkompendium Schweiz 2005* • *R.C. Baselt, Disposition of Toxic Drugs and Chemicals in Men, 6th edition, Biomedical Publikations, 2002,* • *Grundlagen der Arzneimitteltherapie, Documed AG, 2005* • *W.G.Guder, S.Narayanan, H.Wisser, B.Zawta, List of Analytes Preanalytical Variables*