



UPPSALA
UNIVERSITET

Bioinformatics Engineering Programme

Uppsala University School of Engineering

UPTEC X 14 002	Date of issue 2014-02	
Author Gustaf Wellhagen		
Title (English) Predictability and performance of different non-linear mixed-effects models for HbA1c in patients with type 2 diabetes mellitus		
Title (Swedish)		
Abstract <p>To accurately predict the outcome of a late phase study, pharmacometric models can help in drug development. Making informed decision on which models to use will also facilitate drug development. This can depend on the mechanism of action for the drug as well as stability and runtime factors.</p> <p>This is an investigation of four published semi-mechanistic pharmacometric models to predict glycosylated red blood cells (HbA1c) in a late phase study of an anti-diabetic drug together with an assessment of their stability and power to detect drug effects. Mean plasma glucose (MPG), fasting plasma glucose (FPG) or FPG and fasting serum insulin (FSI) are used together with HbA1c as drivers for change in the models. We find that less complex models, with fewer differential equations, are quicker to run and more stable, and that MPG alone is superior to FPG or FPG and FSI to detect a drug effect. The findings are useful for drug development in the anti-diabetic area, and show that a less mechanistic model performs well under these conditions.</p>		
Keywords Type 2 diabetes mellitus, semi-mechanistic models, HbA1c, glucose, insulin, NONMEM		
Supervisors Dr. Maria Kjellsson Uppsala University		
Scientific reviewer Dr. Andrew Hooker Uppsala University		
Project name	Sponsors	
Language English	Security	
ISSN 1401-2138	Classification	
Supplementary bibliographical information	Pages 35	
Biology Education Centre Box 592 S-75124 Uppsala	Biomedical Center Tel +46 (0)18 4710000	Husargatan 3 Uppsala Fax +46 (0)18 471 4687