Web Accessible Population Pharmacokinetics Service – Hemophilia (WAPPS-Hemo): A Service for Bayesian Post Hoc Estimation

Alanna McEneny-King¹, Andrea Edginton¹*, Gary Foster ², Alfonso Iorio ³ on behalf of WAPPS program investigators

¹School of Pharmacy, University of Waterloo, Canada; ²Clinical Epidemiology & Biostatistics, McMaster University, Canada; ³Health Information Research Unit (HIRU), McMaster University

Objective: Tailoring prophylaxis to individual patient characteristics has been shown to effectively increase therapeutic benefit of hemophilia A and B treatment [1]. This project aims to develop a web-accessible service to assess clinically relevant PK of factor VIII and IX through: a) input of patient data, b) automatic estimation of PK parameters, c) expert validation of the estimation process and d) reporting of time to re-infusion (Figure).

Methods: Clinical centres are recruited and must agree to provide at least 5 sets of patient data in the development and testing phase and in return are WAPPS co-investigators with full access to the database. Brand-specific PopPK models are developed using NONMEM/PDx-POP. Structural models and parameterization are based on data obtained from sponsors and literature information. Website development is on the IIS and dot.net platform with an MS SQL server for database management and an https:\ protocol.

Results: Twenty-two centres from 14 countries are currently in the registration process. Data has been received for >700 subjects for model development (10 molecules, 6 sponsors). An additional 250 subjects from clinical sites make up the validation dataset. Eight population models are in the process of precision evaluation with limited samples, retrospective validation with an external dataset and within-patient prospective validation. The program website is live (www.wapps-hemo.org) and the application website is in beta testing.

Conclusions: This project will increase the evidence base used to treat hemophilia patients as the system progressively accrues individual PK data. The interconnection of a Bayesian engine, PopPK routines and smart end user interface will constitute an innovative blend of different high tech approaches to the care of this rare disorder.

Funding: Baxter Canadian Hemophilia Epidemiological Research Program of the Canadian Hemophilia Society to AI.

References: [1] Iorio et al. 2011. Cochrane Database of Systematic Reviews (Online) 9