individual patient information. The pharmacokinetic profile of the patient may be refined or modified based on previous therapeutic plasma protein treatments of the patient and/or patient specific characteristics such as age, body weight, other plasma protein levels, physical activity level, gender, disease state, etc. The system, method, and apparatus provide a graphical interface of the pharmacokinetic profile of the patient that enables a user (e.g., a health care professional) to adjust dosage, dosing interval, and a minimum acceptable concentration of the therapeutic plasma protein within the patient to view how the dosing regimen changes. Such a configuration enables a healthcare provider to determine an optimal dosing regimen that reduces (or prevents) a patient from risk of bleeds as a result of having low levels of clotting factor VIII.

[0008a] In an aspect, there is provided a method for providing a clotting factor VIII dosing regimen comprising: determining a clotting factor VIII clearance for a patient based on two blood samples that have been collected from the patient after an infusion of clotting factor VIII; determining if a patient has a half-life greater than a predetermined threshold; determining, via a processor, an estimated pharmacokinetic profile of a patient using a Bayesian model of pharmacokinetic profiles of sampled patients, the estimated pharmacokinetic profile based upon at least one of a body weight or an age of the patient such that: a first weighting factor is applied to the Bayesian model of pharmacokinetic profiles of sampled patients if the half-life of the patient is greater than the predetermined threshold, and a second weighting factor, less than the first weighting factor, is applied to the Bayesian model of pharmacokinetic profiles of sampled patients if the half-life of the patient is less than the predetermined threshold; determining, via the processor, a dosing regimen for a specified dosing interval including (i) a dosage and (ii) an estimated clotting factor VIII clearance for the patient over a time period based at least upon the estimated pharmacokinetic profile; and displaying the dosing regimen on a client device.

[0008b] In another aspect, there is provided an apparatus for providing a therapeutic plasma protein dosing regimen to a client device, the apparatus comprising: a model generator configured to create a Bayesian model of pharmacokinetic profiles of sampled patients, the Bayesian model including a (i) therapeutic plasma protein clearance and (ii) a volume of distribution relationship for a therapeutic plasma protein based upon at least one of patient age or body weight; and a pharmacokinetic server configured to: determine an approximate pharmacokinetic profile of a patient based upon the Bayesian model, a half-life of the therapeutic plasma protein within the patient, and at least one of an age of the patient or a weight of the

patient; determine the therapeutic plasma protein dosing regimen including a dosage and a therapeutic plasma protein level over a time period based upon the approximate pharmacokinetic profile of the patient; modify the therapeutic plasma protein dosing regimen in response to receiving a dosing interval for applying the dosage to the patient; and transmit the modified therapeutic plasma protein dosing regimen to the client device.

[0008c] In another aspect, there is provided a machine-accessible device having instructions stored thereon that are configured, when executed, to cause a machine to at least: prompt a user to enter at least one of a patient weight or age; use a Bayesian model of pharmacokinetic profiles of sampled patients to determine an approximate pharmacokinetic profile of a patient based upon the Bayesian model, a half-life of the therapeutic plasma protein within the patient, and the at least one of entered patient weight or age, the Bayesian model including (i) a therapeutic plasma protein clearance and (ii) a volume of distribution relationship for a therapeutic plasma protein based upon the at least one of entered patient weight or age; determine a dosing regimen for the patient based upon the approximate pharmacokinetic profile of the patient, the dosing regimen including a dosage and a dosage interval; modify the dosing regimen in response to receiving another dosing interval for applying the dosage to the patient; and enable the dosing regimen and a time-varying therapeutic plasma protein level based on the dosing regimen to be displayed to a user..

[0009] In an example embodiment, a method includes determining an estimated pharmacokinetic profile of a patient using a Bayesian model of pharmacokinetic profiles of sampled patients, the estimated pharmacokinetic profile based upon at least one of a body weight or an age of the patient. The example method also includes determining a first dosing regimen for a first specified dosing interval including (i) a first dosage and (ii) a first therapeutic plasma protein level in the patient over a time period based at least upon the estimated pharmacokinetic profile and determining a second dosing regimen for a second specified dosing interval including (i) a second dosage and (ii) a second therapeutic plasma protein level in the patient over the time period based at least upon the estimated pharmacokinetic profile. The method further includes displaying the first dosing regimen and the second dosing regimen on a client device such that the first dosing regimen is displayed in conjunction with the second dosing regimen.

[0010] In another example embodiment, an apparatus includes a model generator configured to create a Bayesian model of pharmacokinetic profiles of sampled patients, the

Bayesian model including a (i) therapeutic plasma protein clearance and (ii) a volume of distribution relationship for a therapeutic plasma protein based upon at least one of patient age or body weight. The example apparatus also includes a pharmacokinetic server configured to determine an approximate pharmacokinetic profile of a patient based upon the Bayesian model and at least one of an age of the patient or a body weight of the patient and determine a therapeutic plasma protein dosing regimen including a dosage and a therapeutic plasma protein level over a time period based upon the approximate pharmacokinetic profile of the patient. The pharmacokinetic server is also configured to modify the therapeutic plasma protein dosing

CLAIMS

What is claimed is:

1. A method for providing a clotting factor VIII dosing regimen comprising:

determining a clotting factor VIII clearance for a patient based on two blood samples that have been collected from the patient after an infusion of clotting factor VIII;

determining if a patient has a half-life greater than a predetermined threshold;

determining, via a processor, an estimated pharmacokinetic profile of a patient using a Bayesian model of pharmacokinetic profiles of sampled patients, the estimated pharmacokinetic profile based upon at least one of a body weight or an age of the patient such that:

a first weighting factor is applied to the Bayesian model of pharmacokinetic profiles of sampled patients if the half-life of the patient is greater than the predetermined threshold, and

a second weighting factor, less than the first weighting factor, is applied to the Bayesian model of pharmacokinetic profiles of sampled patients if the half-life of the patient is less than the predetermined threshold;

determining, via the processor, a dosing regimen for a specified dosing interval including (i) a dosage and (ii) an estimated clotting factor VIII clearance for the patient over a time period based at least upon the estimated pharmacokinetic profile; and

displaying the dosing regimen on a client device.

2. The method of Claim 1, further comprising adjusting, via the processor, the estimated pharmacokinetic profile of the patient upon previous treatments of the patient.

3. The method of Claim 1, wherein the specified dosing interval is 48 hours or 72 hours.

4. The method of Claim 1, wherein the minimum threshold level is less than 20%.