electronic diaries to record infusion events. Unfortunately, such diaries do not provide actionable data from which a patient is able to plan activity levels. For example, with current systems, patients are unable to ascertain a risk of bleeding if the patient were to participate in an activity such as playing soccer at any point in time after an infusion event. In particular, with current electronic diaries, patients cannot determine their factor level at any given point in time after a prophylactic infusion event, significantly limiting the usefulness of the information provided by such sources.

SUMMARY

In one aspect, the present disclosure refers to a drug monitoring tool that enables a patient to view a personalized real-time indication of clotting factor VIII levels following a prophylactic infusion event, the tool comprising: a data receiver configured to receive, from a secured server, a pharmacokinetic (PK) profile of a patient, wherein the secured server is configured to create a Bayesian model of PK profiles of sampled patients and based upon at least one of a bodyweight, von Willebrand factor ("vWF") level, and/or an age of the patient; and an interactive user interface wherein the interactive user interface includes a graphical control element configured to receive patient input corresponding to a request for the time-varying amount of the therapeutic plasma protein within the patient; the interactive user interface being configured to: display to the patient a graphical representation of a time–varying therapeutic plasma protein level of the patient, the time-varying therapeutic plasma protein level based on an administered dose of a clotting factor VIII and the PK profile of the patient; and delineate zones associated with the time-varying amount of the therapeutic plasma protein level, wherein each zone is associated with a particular concentration range of the time-varying amount of the therapeutic plasma protein within the patient, the zones including a safe zone which indicates that the patient's level of time-varying therapeutic plasma protein indicates a level of clotting factor VIII such that the patient is safe for physically demanding activity; and a danger zone which indicates that the patient's level of therapeutic plasma protein indicates a level of clotting factor VIII such that activity levels of the patient should be kept to a minimum. In yet another aspect, the present disclosure refers to a method for drug monitoring executed by a drug monitoring tool, wherein

the drug monitoring enables a patient to view a personalized real-time indication of clotting factor VIII levels following a prophylactic infusion event, the method comprising: receiving a pharmacokinetic (PK) profile of a patient for a clotting factor from a secured server, wherein

the PK profile of the patient is based on a Bayesian model of PK profiles of sampled patients and based upon at least one of a bodyweight, von Willebrand factor ("vWF") level, and/or an age of the patient; and providing an interactive user interface comprising a graphical control element configured to receive patient input corresponding to a request for the time-varying am ount of the therapeutic plasma protein within the patient, enabling the interactive user interface to display to a patient a time-varying therapeutic plasma protein level of the patient, the time-varying therapeutic plasma protein level based on an administered dose of a clotting factor VIII and the PK profile of the patient; the time-varying levels of the clotting factor being displayed in zones, the zones including a safe zone which indicates that the patient's level of therapeutic plasma protein indicates a level of clotting factor VIII such that the patient is safe for physically demanding activity; and a danger zone which indicates that the patient's level of therapeutic plasma protein indicates a level of clotting factor VIII such that activity levels of the patient should be kept to a minimum; and displaying the graphical representation of the time varying amount of the therapeutic plasma protein within the patient .

Examples of the present disclosure provide a drug monitoring tool that enables a patient to view a personalized, real-time indication of clotting factor VIII levels following a prophylactic infusion event. Advantageously, the disclosed drug monitoring tool allows a patient to significantly reduce bleeding events. For instance, the real-time indication of clotting factor VIII provided by the drug monitoring tool enables the patient to make informed decisions related to an amount and/or intensity of physical activity at any given point in time. In an example in which the drug monitoring tool provides an indication of a low level of clotting factor VIII, the patient may refrain from participating in a physically demanding activity such as a sport, decide to self-administer a non-prophylactic dose of clotting factor VIII in order to participate in the physically demanding activity, or choose a low bleed risk activity (e.g., a stationary activity such as reading a book) until the next prophylactic infusion. Thus, the drug monitoring tool advantageously eliminates patient bleed events due to a lack of actionable information.

In one example, a drug monitoring tool comprises a data receiver configured to receive a pharmacokinetic (PK) profile of a patient. The tool also comprises an interactive user interface configured to present to a patient a time–varying drug

concentration level in the patient. The time-varying drug concentration level is based on an administered dose of a subject drug and the PK profile of the patient.

In another example, disclosed is a drug monitoring tool. The tool comprises a data receiver configured to receive a pharmacokinetic (PK) profile of a patient. In

CLAIMS

What is claimed is:

1. A drug monitoring tool that enables a patient to view a personalized real-time indication of clotting factor VIII levels following a prophylactic infusion event, the tool comprising:

a data receiver configured to receive, from a secured server, a pharmacokinetic (PK) profile of a patient, wherein the secured server is configured to create a Bayesian model of PK profiles of sampled patients and based upon at least one of a bodyweight, von Willebrand factor ("vWF") level, and/or an age of the patient.; and an interactive user interface wherein the interactive user interface includes a graphical control element configured to receive patient input corresponding to a request for the time-varying amount of the therapeutic plasma protein within the patient; the interactive user interface being configured to:

display to the patient a graphical representation of a time-varying therapeutic plasma protein level of the patient, the time-varying therapeutic plasma protein level based on an administered dose of a clotting factor VIII and the PK profile of the patient; and

delineate zones associated with the time varying amount of the therapeutic plasma protein, wherein each zone is associated with a particular concentration range of the time-varying amount of the therapeutic plasma protein within the patient, the zones including

a safe zone which indicates that the patient’s level of therapeutic plasma protein indicates a level of clotting factor VIII such that the patient is safe for physically demanding activity; and

a danger zone which indicates that the patient’s level of therapeutic plasma protein indicates a level of clotting factor VIII such that activity levels of the patient should be kept to a minimum.

2. The drug monitoring tool of claim 1 wherein:

the data receiver is a camera configured to scan a quick response (QR) code storing patient information that includes at least PK profile information; and

the drug monitoring tool further comprising a QR code processor configured to extract and process the patient information stored within the QR code, optionally further comprising a QR code generator configured to generate the QR code having patient information encrypted using

AES-256 encryption with cipher block chaining (CBC) and public-key cryptography standards (PKCS) padding

3. The drug monitoring tool of claim 1 wherein the data receiver is a communications interface configured to receive the PK profile from a secured server, the received PK profile being encrypted and the communications interface further configured to decrypt the encrypted PK profile

4. The drug monitoring tool of claim 2 wherein the QR code includes at least one of or any combination of: patient identifying information, patient physiological data, patient dosing information, and/or PK profile information of the patient, wherein the patient dosing information includes a prophylactic dosing regimen for a particular clotting factor VIII drug.

5. The drug monitoring tool of claim 1 further comprising an activation toolkit configured to enable access to functionalities of the drug monitoring tool in response to at least of: receiving the PK profile the patient and/or receiving a log of a first prophylactic infusion.

6. A method for drug monitoring executed by a drug monitoring tool, wherein the drug monitoring enables a patient to view a personalized real-time indication of clotting factor VIII levels following a prophylactic infusion event, the method comprising:

receiving a pharmacokinetic (PK) profile of a patient for a clotting factor from a secured server, wherein the PK profile of the patient is based on a Bayesian model of PK profiles of sampled patients and based upon at least one of a bodyweight, von Willebrand factor ("vWF") level, and/or an age of the patient; and

providing an interactive user interface comprising a graphical control element configured to receive patient input corresponding to a request for the time-varying amount of the therapeutic plasma protein within the patient, enabling the interactive user interface to display to a patient a time-varying therapeutic plasma protein level of the patient, the time-varying therapeutic plasma protein level based on an administered dose of a clotting factor VIII and the PK profile of the patient; the time-varying levels of the clotting factor being displayed in zones, the zones including

a safe zone which indicates that the patient's level of therapeutic plasma protein indicates a level of clotting factor VIII such that the patient is safe for physically demanding activity; and

a danger zone which indicates that the patient's level of therapeutic plasma protein indicates a level of clotting factor VIII such that activity levels of the patient should be kept to a minimum; and

displaying the graphical representation of the time varying amount of the therapeutic plasma protein within the patient

7. The method of claim 6 wherein:

receiving the PK profile includes scanning a quick response (QR) code storing patient information that includes at least PK profile information; and

extracting and processing the patient information stored within the QR code.

8. The method of claim 6 further comprising the received PK profile being encrypted; and decrypting the encrypted PK profile.

9. The method of claim 7 wherein the QR code includes at least one of or any combination of: patient identifying information, patient physiological data, patient dosing information, and/or PK profile information of the patient, wherein the patient dosing information includes a prophylactic dosing regimen for a particular clotting factor VIII drug.

10. The method of claim 6 further comprising enabling patient access to functionalities of the drug monitoring tool in response to at least of: receiving the PK profile the patient and/or receiving a log of a first prophylactic infusion.