patient factors, but also observed patient-specific responses that are not accounted for within the models themselves, and that reflect BSV that distinguishes the specific patient from the typical patient reflected by the model.

[0020A] In a first aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a database stored in the memory, the database being accessible by the microprocessor and storing information indicative of dosing regimens configured for use with the medication, the method comprising operating the system to: store a plurality of mathematical models in the memory, each model describing response profiles for a population of patients treated with the medication, each model further describing a plurality of typical patient responses as a function of covariate patient factors; receive data indicative of characteristics of a specific patient, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information; select a mathematical model from the plurality of mathematical models in the memory to match the characteristics of the specific patient with covariate patient factors of the selected mathematical model; receive a first plurality of proposed dosing regimens from the database; forecast at least one typical patient response from the plurality of typical patient responses for each of the first plurality of proposed dosing regimens as a function of the selected model; select a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics; provide, as output from the system, the recommended typical dosing regimen; receive

data reflecting an observed response of the specific patient to an administered dosing regimen; update the selected model as a function of the observed patient response data, to create an updated patient-specific mathematical model; receive a second plurality of proposed dosing regimens from the database; forecast a patient-specific response for each of the second plurality of proposed dosing regimens, as a function of the updated patient-specific mathematical model; select a recommended patient-specific dosing regimen suitable for the specific patient; and provide, as output from the system, the recommended patient-specific dosing regimen.

[0020B] In a second aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a plurality of mathematical models, each of the plurality of mathematical models describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to: perform Bayesian model averaging to develop a composite model as a function of the plurality of mathematical models and characteristics of a specific patient corresponding to the covariate patient factors of the models, the composite model describing a response profile for a typical patient having as covariate patient factors the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information; process the composite model to perform Bayesian forecasting to forecast a typical patient response for each of

a first plurality of proposed dosing regimens as a function of the composite model; select, from a set of forecasted typical patient responses, a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics, the recommended typical dosing regimen being selected to achieve a predefined target response; provide, as output from the system, the recommended typical dosing regimen; receive data reflecting an observed response of the specific patient to an administered dosing regimen; perform a Bayesian update to each of the plurality of mathematical models, as a function of the observed patient response data, to create a corresponding plurality of updated patient-specific mathematical models; perform Bayesian model averaging of the plurality of updated patient-specific mathematical models to develop an updated patient-specific composite model; perform Bayesian forecasting to forecast a patient-specific response for each of a second plurality of proposed dosing regimens, as a function of the updated patient-specific composite model; select, from a set of forecasted patient-specific responses, a recommended patient-specific dosing regimen suitable for the specific patient, the recommended patient-specific dosing regimen being selected to achieve the predefined target response; and provide, as output from the system, the recommended patient-specific dosing regimen.

[0020C] In a third aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a plurality of mathematical models, each of the plurality of mathematical models describing response profiles for a population of patients treated

with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to: perform Bayesian model averaging to develop a composite model as a function of the plurality of mathematical models and characteristics of a specific patient corresponding to the covariate patient factors of the models, the composite model describing a response profile for a typical patient having as covariate patient factors the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information; process the composite model to perform Bayesian forecasting to forecast a patient response for each of a first plurality of proposed dosing regimens as a function of the composite model; select, from a set of forecasted typical patient responses, a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics, the recommended typical dosing regimen being selected to achieve a predefined target response; and provide, as output from the system, the recommended typical dosing regimen.

[0020D] In a fourth aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a plurality of mathematical models, each of the plurality of mathematical models describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to: perform Bayesian model averaging to develop a composite model as a function of the

plurality of mathematical models and characteristics of a specific patient corresponding to the covariate patient factors of the models, the composite model describing a response profile for a typical patient having as covariate patient factors the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information; receive data reflecting an observed response of the specific patient to an administered dosing regimen; perform a Bayesian update to each of the plurality of mathematical models, as a function of the observed patient response data, to create a corresponding plurality of updated patient-specific mathematical models; perform Bayesian model averaging of the plurality of updated patient-specific mathematical models to develop an updated patient-specific composite model; and provide, as output from the system, the updated patient-specific composite model.

[0020E] In a fifth aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and at least one mathematical models, each mathematical model describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to: process the model to perform Bayesian forecasting to forecast a patient response for each of a first plurality of proposed dosing regimens as a function of the model; select, from a set of forecasted typical patient responses, a recommended dosing regimen suitable for a

typical patient having the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information, the recommended typical dosing regimen being selected to achieve a predefined target response; provide, as output from the system, the recommended typical dosing regimen; receive data reflecting an observed response of the specific patient to an administered dosing regimen; perform a Bayesian update to each mathematical model, as a function of the observed patient response data, to create a corresponding updated patient-specific mathematical model; perform Bayesian forecasting to forecast a patient-specific response for each of a second plurality of proposed dosing regimens, as a function of each updated patient-specific model; select, from a set of forecasted patient-specific responses, a recommended patient-specific dosing regimen suitable for the specific patient, the recommended patient-specific dosing regimen being selected to achieve the predefined target response; and provide, as output from the system, the recommended patient-specific dosing regimen.

[0020F] In a sixth aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and at least one mathematical models, each mathematical model describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to: receive data reflecting an observed response of the specific patient to an administered dosing

regimen; perform a Bayesian update to each mathematical model, as a function of the observed patient response data, to create a corresponding updated patient-specific mathematical model; perform Bayesian forecasting to forecast a patient-specific response for each of a second plurality of proposed dosing regimens, as a function of each updated patient-specific model; select, from a set of forecasted patient-specific responses, a recommended patient-specific dosing regimen suitable for the specific patient, the recommended patient-specific dosing regimen being selected to achieve the predefined target response; and provide, as output from the system, the recommended patient-specific dosing regimen.

[0020G] In a seventh aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and at least two mathematical models, each mathematical model describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to: process each respective model to perform Bayesian forecasting to forecast a typical patient response for each of a first plurality of proposed dosing regimens as a function of the respective model; select, from a set of forecasted typical patient responses, a recommended dosing regimen suitable for a typical patient having the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information, the recommended typical dosing

regimen being selected to achieve a predefined target response; provide, as output from the system, the recommended typical dosing regimen; receive data reflecting an observed response of the specific patient to an administered dosing regimen; perform a Bayesian update to each mathematical model, as a function of the observed patient response data, to create a corresponding updated patient-specific mathematical model; and provide, as output from the system, the updated patient-specific mathematical model.

[0020H] In an eighth aspect of the invention, there is provided a method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the method comprising: receiving data indicative of characteristics of a specific patient, wherein the characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information; comparing the received data with a database to select a first model representing the specific patient; forecasting at least one patient response for each of a first plurality of dosing regimens as a function of the selected first model; based on the forecasted at least one patient response, selecting a first recommended dosing regimen; outputting the recommended dosing regimen; receiving data reflecting an observed response of the specific patient to the recommended dosing regimen; updating the selected first model based on the received data reflecting the observed response of the specific patient, to create an updated patient-specific model; forecasting a patient-specific response for each of a second plurality of dosing regimens, as a function of the updated patient-specific model; based on the forecasted patient-specific

response, selecting a second recommended patient-specific dosing regimen; and providing, as output from the system, the second recommended patient-specific dosing regimen.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] An understanding of the following description will be facilitated by reference to the attached drawings, in which:

[0022] Figure 1 is a flow diagram illustrating an exemplary prior art method for developing a medication dosing regimen for a patient;

[0023] Figure 2 is a flow diagram illustrating an exemplary method for providing patient-specific medication dosing as a function of mathematical models updated to account for an observed patient response in accordance with an exemplary embodiment of the present invention; and

[0024] Figure 3 is a schematic diagram of an exemplary system for providing patient-specific medication dosing as a function of mathematical models updated to account for an observed patient response in accordance with an exemplary embodiment of the present invention;

[0025] Figure 4 is a series of graphs showing relationships between times since last dose (TSLD) and observed/predicted patient responses for sixteen exemplary patients;

[0026] Figures 5A-5D are exemplary graphs showing infliximab blood level concentrations as a function of time;

What is claimed is:

1. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a database stored in the memory, the database being accessible by the microprocessor and storing information indicative of dosing regimens configured for use with the medication, the method comprising operating the system to:

store a plurality of mathematical models in the memory, each model describing response profiles for a population of patients treated with the medication, each model further describing a plurality of typical patient responses as a function of covariate patient factors;

receive data indicative of characteristics of a specific patient, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information;

select a mathematical model from the plurality of mathematical models in the memory to match the characteristics of the specific patient with covariate patient factors of the selected mathematical model;

receive a first plurality of proposed dosing regimens from the database;

forecast at least one typical patient response from the plurality of typical patient responses for each of the first plurality of proposed dosing regimens as a function of the selected model;

select a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics;

provide, as output from the system, the recommended typical dosing regimen;

receive data reflecting an observed response of the specific patient to an administered dosing regimen;

update the selected model as a function of the observed patient response data, to create an updated patient-specific mathematical model;

receive a second plurality of proposed dosing regimens from the database;

forecast a patient-specific response for each of the second plurality of proposed dosing regimens, as a function of the updated patient-specific mathematical model;

select a recommended patient-specific dosing regimen suitable for the specific patient; and

provide, as output from the system, the recommended patient-specific dosing regimen.

2. The method of claim 1, wherein the typical patient response is forecasted by processing the selected model using a Bayesian forecasting technique.

3. The method of claim 1, wherein forecasting the typical patent response comprises the system:

receiving as input the first plurality of proposed dosing regimens; and

forecasting a corresponding typical patient response for each of the first plurality of proposed dosing regimens.

4. The method of claim 3, wherein selecting a recommended typical dosing regimen comprises the system:

selecting from the forecasted typical patient responses a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics, the recommended typical dosing regimen being selected for meeting predefined criteria.

5. The method of claim 3, wherein providing as output the recommended typical dosing regimen comprises outputting a list including a plurality of alternative recommended typical dosing regimens.

6. The method of claim 1, wherein forecasting the at least one typical patient response comprises the system:

automatically selecting the first plurality of proposed dosing regimens according to predefined logic; and

forecasting a typical patient response for each of the first plurality of proposed dosing regimens.

7. The method of claim 6, wherein automatically selecting the first plurality of proposed dosing regimens according to predefined logic comprises selecting a next proposed dosing regimen as a function of a forecasted typical patient response to a proposed dosing regimen.

8. The method of claim 7, wherein the predefined logic provides for selection of the first plurality of proposed dosing regimens to provide a corresponding forecasted typical patient response best meeting a treatment objective.

9. The method of claim 7, wherein the predefined logic provides for selection of the first plurality of proposed dosing regimens to find a minimum of an objective function.

10. The method of claim 7, wherein the predefined logic provides for selection of the first plurality of proposed dosing regimens to find a global minimum of an objective function.

11. The method of claim 6, further comprising the system:

selecting from the forecasted typical patient responses a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics, the recommended typical dosing regimen being selected for meeting predefined criteria.

12. The method of claim 11, further comprising the system providing as output the recommended typical dosing regimen.

13. The method of claim 11, further comprising the system providing as output a list including a plurality of recommended typical dosing regimens.

14. The method of claim 1, wherein forecasting the patient-specific response comprises the system:

receiving as input the second plurality of proposed dosing regimens; and

forecasting a corresponding patient-specific response for each of the second plurality of proposed dosing regimens.

15. The method of claim 1, wherein selecting a recommended patient-specific dosing regimen comprises the system:

selecting from the forecasted patient-specific responses a recommended patient-specific dosing regimen suitable for the specific patient, the recommended patient-specific dosing regimen being selected for meeting predefined criteria.

16. The method of claim 1, wherein providing as output the recommended patient-specific dosing regimen comprises outputting a list including a plurality of alternative recommended patient-specific dosing regimens.

17. The method of claim 1, wherein forecasting a patient-specific response comprises the system:

automatically selecting the second plurality of proposed dosing regimens according to predefined logic; and

forecasting a patient-specific response for each of the second plurality of proposed dosing regimens.

18. The method of claim 17, wherein automatically selecting the second plurality of proposed dosing regimens according to predefined logic comprises selecting a next proposed dosing regimen as a function of a forecasted patient-specific response to a proposed dosing regimen.

19. The method of claim 17, wherein the predefined logic provides for selection of the second plurality of proposed dosing regimens to provide a corresponding forecasted patient-specific response best meeting a treatment objective.

20. The method of claim 17, wherein the predefined logic provides for selection of the second plurality of proposed dosing regimens to find a minimum of an objective function.

21. The method of claim 17, wherein the predefined logic provides for selection of the second plurality of proposed dosing regimens to find a global minimum of an objective function.

22. The method of claim 16, further comprising the system:

selecting from the forecasted patient-specific responses a recommended patient-specific dosing regimen suitable for the specific patient, the recommended typical patient-specific dosing regimen being selected for meeting predefined criteria.

23. The method of claim 22, further comprising the system providing as output the recommended patient-specific dosing regimen.

24. The method of claim 22, further comprising the system providing as output a list including a plurality of recommended patient-specific dosing regimens.

25. The method of claim 1, whereinthe selected model is updated by processing the selected model using a Bayesian updating technique.

26. The method of claim 1, wherein the updated patient-specific mathematical model is processed using a Bayesian model averaging technique.

27. The method of claim 1, wherein the patient-specific response is forecasted by processing the updated patient-specific mathematical model using a Bayesian forecasting technique.

28. The method of claim 1, wherein the recommended typical dosing regimen is selected from among a set of typical dosing regimens the recommended typical dosing regimen being selected for providing an associated forecasted patient response closely matching predefined criteria.

29. The method of claim 28, wherein the predefined criteria is a target patient response.

30. The method of claim 1, wherein the recommended patient-specific dosing regimen is selected from among a set of patient-specific dosing regimens, the recommended patient-specific dosing regimen being selected for providing an associated forecasted patient response closely matching predefined criteria.

31. The method of claim 30, wherein the predefined criteria is a target patient response.

32. The method of claim 1, wherein the covariate patient factors comprise at least one covariate patient factor selected from the group consisting of a blood concentration level, a blood pressure reading, and a hematocrit level.

33. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a plurality of mathematical models, each of the plurality of mathematical models describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to:

perform Bayesian model averaging to develop a composite model as a function of the plurality of mathematical models and characteristics of a specific patient corresponding to the covariate patient factors of the models, the composite model describing a response profile for a typical patient having as covariate patient factors the specific patient's characteristics, wherein

characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information;

process the composite model to perform Bayesian forecasting to forecast a typical patient response for each of a first plurality of proposed dosing regimens as a function of the composite model;

select, from a set of forecasted typical patient responses, a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics, the recommended typical dosing regimen being selected to achieve a predefined target response;

provide, as output from the system, the recommended typical dosing regimen;

receive data reflecting an observed response of the specific patient to an administered dosing regimen;

perform a Bayesian update to each of the plurality of mathematical models, as a function of the observed patient response data, to create a corresponding plurality of updated patient-specific mathematical models;

perform Bayesian model averaging of the plurality of updated patient-specific mathematical models to develop an updated patient-specific composite model;

perform Bayesian forecasting to forecast a patient-specific response for each of a second plurality of proposed dosing regimens, as a function of the updated patient-specific composite model;

select, from a set of forecasted patient-specific responses, a recommended patient-specific dosing regimen suitable for the specific patient, the recommended patient-specific dosing regimen being selected to achieve the predefined target response; and

provide, as output from the system, the recommended patient-specific dosing regimen.

34. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a plurality of mathematical models, each of the plurality of mathematical models describing response profiles for a population of patients treated

with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to:

perform Bayesian model averaging to develop a composite model as a function of the plurality of mathematical models and characteristics of a specific patient corresponding to the covariate patient factors of the models, the composite model describing a response profile for a typical patient having as covariate patient factors the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information;

process the composite model to perform Bayesian forecasting to forecast a patient response for each of a first plurality of proposed dosing regimens as a function of the composite model;

select, from a set of forecasted typical patient responses, a recommended typical dosing regimen suitable for a typical patient having the specific patient's characteristics, the recommended typical dosing regimen being selected to achieve a predefined target response; and

provide, as output from the system, the recommended typical dosing regimen.

35. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and a plurality of mathematical models, each of the plurality of mathematical models describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to:

perform Bayesian model averaging to develop a composite model as a function of the plurality of mathematical models and characteristics of a specific patient corresponding to the covariate patient factors of the models, the composite model describing a response profile for a typical patient having as covariate patient factors the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information;

receive data reflecting an observed response of the specific patient to an administered dosing regimen;

perform a Bayesian update to each of the plurality of mathematical models, as a function of the observed patient response data, to create a corresponding plurality of updated patient-specific mathematical models;

perform Bayesian model averaging of the plurality of updated patient-specific mathematical models to develop an updated patient-specific composite model; and

provide, as output from the system, the updated patient-specific composite model.

36. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and at least one mathematical models, each mathematical model describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to:

process the model to perform Bayesian forecasting to forecast a patient response for each of a first plurality of proposed dosing regimens as a function of the model;

select, from a set of forecasted typical patient responses, a recommended dosing regimen suitable for a typical patient having the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information, the recommended typical dosing regimen being selected to achieve a predefined target response;

provide, as output from the system, the recommended typical dosing regimen;

receive data reflecting an observed response of the specific patient to an administered dosing regimen;

perform a Bayesian update to each mathematical model, as a function of the observed patient response data, to create a corresponding updated patient-specific mathematical model;

perform Bayesian forecasting to forecast a patient-specific response for each of a second plurality of proposed dosing regimens, as a function of each updated patient-specific model;

select, from a set of forecasted patient-specific responses, a recommended patient-specific dosing regimen suitable for the specific patient, the recommended patient-specific dosing regimen being selected to achieve the predefined target response; and

provide, as output from the system, the recommended patient-specific dosing regimen.

37. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and at least one mathematical models, each mathematical model describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to:

receive data reflecting an observed response of the specific patient to an administered dosing regimen;

perform a Bayesian update to each mathematical model, as a function of the observed patient response data, to create a corresponding updated patient-specific mathematical model;

perform Bayesian forecasting to forecast a patient-specific response for each of a second plurality of proposed dosing regimens, as a function of each updated patient-specific model;

select, from a set of forecasted patient-specific responses, a recommended patient-specific dosing regimen suitable for the specific patient, the recommended patient-specific dosing regimen being selected to achieve the predefined target response; and

provide, as output from the system, the recommended patient-specific dosing regimen.

38. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the system comprising a microprocessor, a memory, and at least two mathematical models, each mathematical model describing response profiles for a population of patients treated with the medication, each model further describing typical patient responses as a function of covariate patient factors, the method comprising operating the system to:

process each respective model to perform Bayesian forecasting to forecast a typical patient response for each of a first plurality of proposed dosing regimens as a function of the respective model;

select, from a set of forecasted typical patient responses, a recommended dosing regimen suitable for a typical patient having the specific patient's characteristics, wherein characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information, the recommended typical dosing regimen being selected to achieve a predefined target response;

provide, as output from the system, the recommended typical dosing regimen;

receive data reflecting an observed response of the specific patient to an administered dosing regimen;

perform a Bayesian update to each mathematical model, as a function of the observed patient response data, to create a corresponding updated patient-specific mathematical model; and

provide, as output from the system, the updated patient-specific mathematical model.

39. The method of claim 1, wherein the recommended patient-specific dosing regimen includes at least a recommended dosage amount and a recommended time interval between doses that are specific to the patient.

40. A method for providing a patient-specific dosing regimen for treatment with a medication using a computerized medication dosing regimen recommendation system, the method comprising:

receiving data indicative of characteristics of a specific patient, wherein the characteristics of the specific patient include at least one of disease stage, disease status, prior therapy, concomitant diseases, demographic information, and laboratory test result information;

comparing the received data with a database to select a first model representing the specific patient;

forecasting at least one patient response for each of a first plurality of dosing regimens as a function of the selected first model;

based on the forecasted at least one patient response, selecting a first recommended dosing regimen;

outputting the recommended dosing regimen;

receiving data reflecting an observed response of the specific patient to the recommended dosing regimen;

updating the selected first model based on the received data reflecting the observed response of the specific patient, to create an updated patient-specific model;

forecasting a patient-specific response for each of a second plurality of dosing regimens, as a function of the updated patient-specific model;

based on the forecasted patient-specific response, selecting a second recommended patient-specific dosing regimen; and

providing, as output from the system, the second recommended patient-specific dosing regimen.