

CLAIMS

What is claimed is:

1. A non-transitory computer-readable medium with instructions stored thereon, that when executed by a processor, perform a method comprising:

5 calculating an aggregated risk factor score representative of each of five or more risk factors associated with a patient's drug regimen, wherein the five or more risk factors comprise:

1) number of active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the number of active ingredients in the drug regimen comprises importing a data set comprising patient-specific drug regimens, converting said data set into
10 respective active ingredients, quantifying the number of active ingredients each patient-specific regimen contains, and assigning the risk factor score representative of the number of active ingredients in the drug regimen;

2) anticholinergic burden of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the anticholinergic burden of the active ingredients
15 in the drug regimen comprises importing a data set comprising indices of anticholinergic burden, associating the respective active ingredients with their clinically determined anticholinergic value, quantifying the value for the entire respective regimen, and assigning the aggregated risk factor score representative of the anticholinergic burden of the drug regimen;

3) sedative burden of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the sedative burden of the active ingredients in the
20 drug regimen comprises importing a data set comprising indices of sedation effects, associating the respective active ingredients with their clinically determined sedation value, quantifying the value for the entire respective regimen, and assigning the aggregated risk factor score representative of the sedative burden of the drug regimen;

4) QT-interval prolongation risk of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the QT-interval prolongation risk of the
25 active ingredients in the drug regimen comprises importing a data set comprising indices of QT-prolongation risk, associating the respective active ingredients with their clinically determined QT-risk value, quantifying the value for the entire respective regimen, and assigning the aggregated risk factor
30 score representative of the QT-interval prolongation risk of the drug regimen; and

5) competitive inhibition of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the competitive inhibition of the active ingredients

- in the drug regimen comprises importing a data set comprising metabolic pathways and extent of metabolism for each active ingredient, associating the respective ingredients with competitive inhibition values based on shared pathways, quantifying the competitive inhibition value for the entire respective regimen, and assigning the aggregated risk factor score representative of the competitive inhibition of the drug regimen; and
- 5 combining the aggregated risk factor scores calculated for each of said five or more risk factors to provide a quantitative personalized medication risk score that is representative of the patient's risk for an adverse drug event.
- 10 2. The non-transitory computer-readable medium according to claim 1, the method comprising combining the aggregated risk factor scores calculated for each of said five or more risk factors to further provide a data set representative of a patient population's risk of an adverse drug event.
- 15 3. The non-transitory computer-readable medium according to claim 1, the method comprising providing the quantitative personalized medication risk score as a visual representation of a relative risk of each of said risk factors with respect to each other.
4. A processor configured to implement the non-transitory computer-readable medium with instructions stored thereon according to claim 1.
- 20 5. A client device comprising the processor of claim 4, a communication infrastructure, a memory, a user interface and a communication interface.
- 25 6. A system comprising one or more computing devices, the one or more computing devices comprising one or more processors according to claim 4.
7. A computer-implemented system for determining a patient's risk of an adverse drug event based at least on the patient's drug regimen comprising:
- 30 a database containing five or more data sets related to the patient's risk factors, wherein the five or more data sets comprise: (1) number of active ingredients in the drug regimen, (2) anticholinergic burden of

the active ingredients in the drug regimen, (3) sedative burden of the active ingredients in the drug regimen, (4) QT-interval prolongation risk of the active ingredients in the drug regimen, and (5) competitive inhibition of the active ingredients in the drug regimen; and

a calculating module, which applies algorithms to said five or more data sets and calculates a

quantitative personalized medication risk score that is representative of the patient's risk for an adverse drug event, wherein the calculating module calculates the quantitative personalized medication risk score by combining aggregated risk factor scores calculated for each of said five or more data sets related to the patient's risk factors, wherein the five or more risk factors comprise:

- 1) number of active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the number of active ingredients in the drug regimen comprises importing a data set comprising patient-specific drug regimens, converting said data set into respective active ingredients, quantifying the number of active ingredients each patient-specific regimen contains, and assigning the risk factor score representative of the number of active ingredients in the drug regimen,
- 2) anticholinergic burden of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the anticholinergic burden of the active ingredients in the drug regimen comprises importing a data set comprising indices of anticholinergic burden, associating the respective active ingredients with their clinically determined anticholinergic value, quantifying the value for the entire respective regimen, and assigning the aggregated risk factor score representative of the anticholinergic burden of the drug regimen,
- 3) sedative burden of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the sedative burden of the active ingredients in the drug regimen comprises importing a data set comprising indices of sedation effects, associating the respective active ingredients with their clinically determined sedation value, quantifying the value for the entire respective regimen, and assigning the aggregated risk factor score representative of the sedative burden of the drug regimen,
- 4) QT-interval prolongation risk of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the QT-interval prolongation risk of the active ingredients in the drug regimen comprises importing a data set comprising indices of QT-prolongation risk, associating the respective active ingredients with their clinically determined QT-risk value, quantifying the value for the entire respective regimen, and assigning the aggregated risk factor score representative of the QT-interval prolongation risk of the drug regimen, and
- 5) competitive inhibition of the active ingredients in the drug regimen, wherein calculating the aggregated risk factor score representative of the competitive inhibition of the active ingredients in the drug regimen comprises importing a data set comprising metabolic pathways and extent of

metabolism for each active ingredient, associating the respective ingredients with competitive inhibition values based on shared pathways, quantifying the competitive inhibition value for the entire respective regimen, and assigning the aggregated risk factor score representative of the competitive inhibition of the drug regimen.