Translational Medicine Breath Research

Amanda Gisler, Nadine Oser, Pablo Sinues, Kapil Dev Singh, Mohamad Awchi, Jakob Usemann, Kim Arnold, Isabel Gonzalez, Fabienne Decrue, Mélina Richard

BREATH ANALYSIS:
- Under-utilized so far
- Easy – and painless to collect/non-invasive
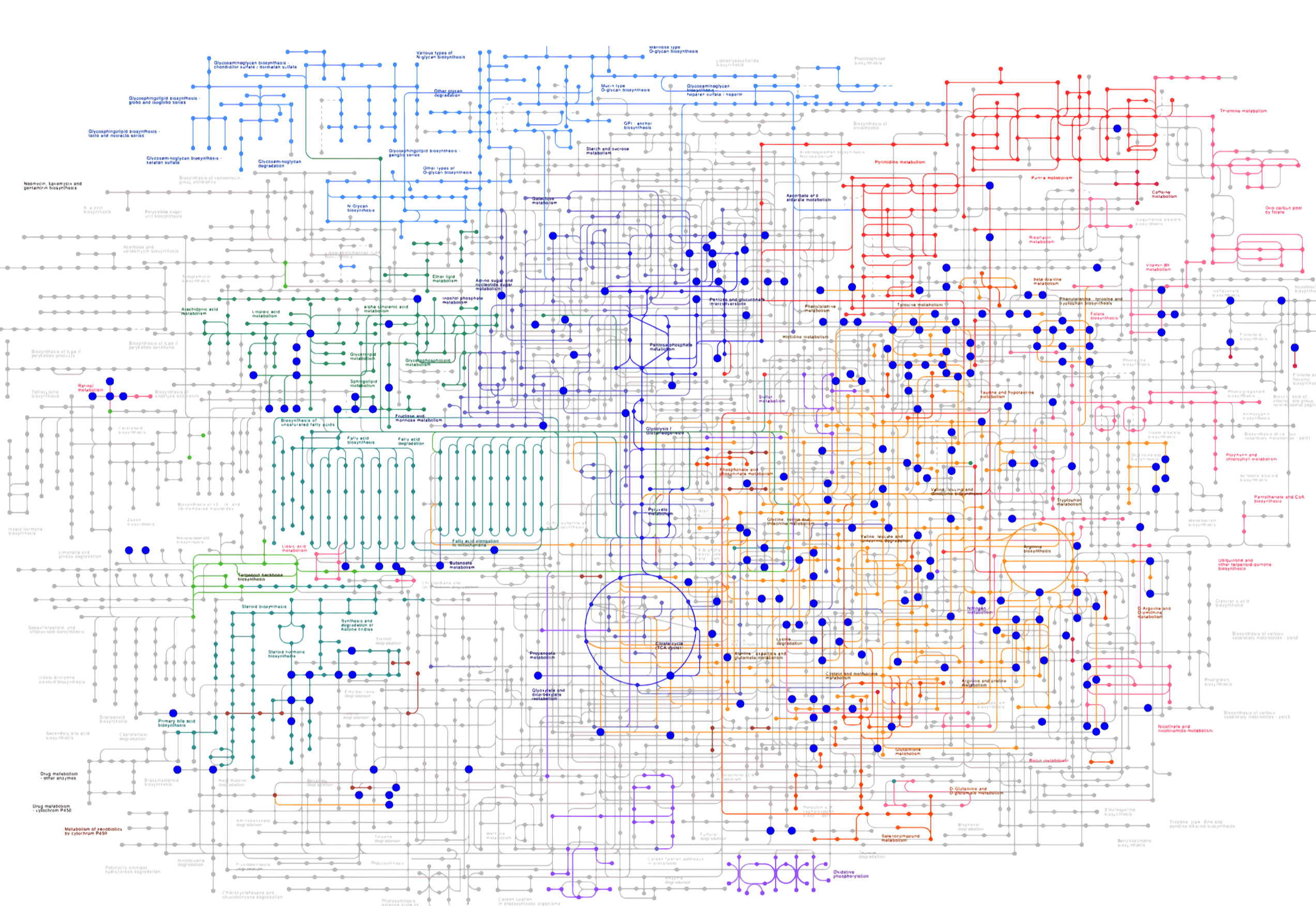
WHAT WE PROPOSE
- Wide endogenous metabolome coverage: 300+ metabolites
- Real-time monitoring
- High Sensitivity down to one part per trillion

OUTCOME
- Individualized treatment / Personalized Medicine
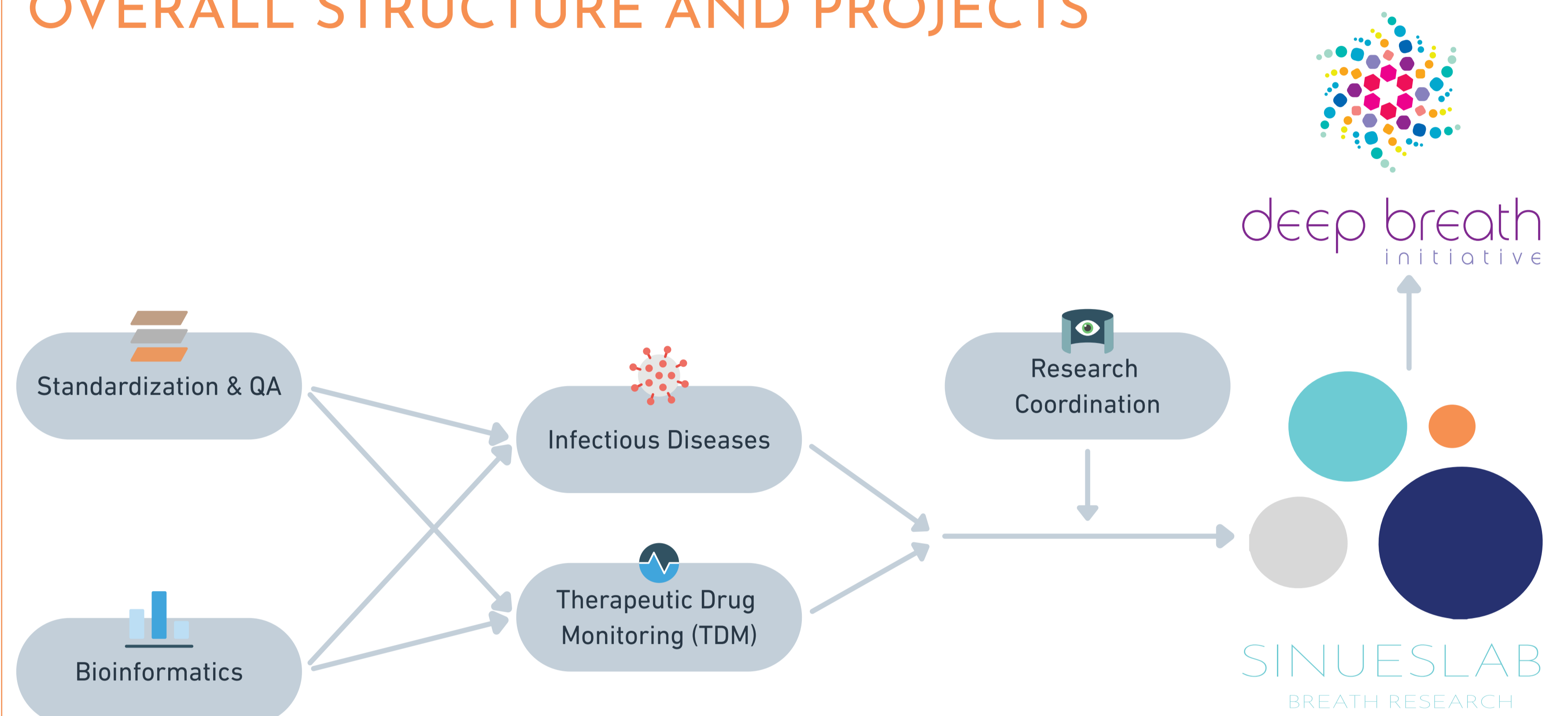- Ideal for large-scale screening and implementing deep learning
- Cost effective, Fast

OVERALL STRUCTURE AND PROJECTS

Unprecedented breath metabolome coverage. Human metabolic network displaying the metabolites accessible by SESI-MS technique (blue dots).

FLAGSHIP PROJECT
THERAPEUTIC DRUG MONITORING GUIDED BY BREATH ANALYSIS

THE PROBLEM:

- Therapeutic management of epilepsy and cancer remains a clinical challenge
- Highly individual-specific response to medication
- High side effects
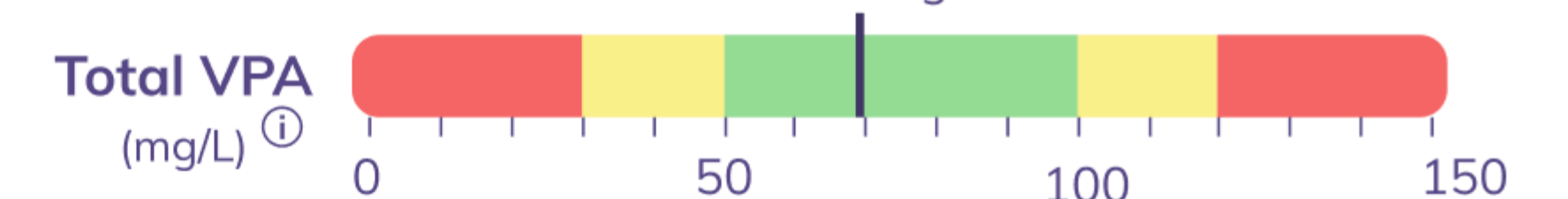- Narrow therapeutic range, which requires constant monitoring

OUR SOLUTION:

- Individualized therapeutic drug monitoring guided by breath analysis (see bottom figure)
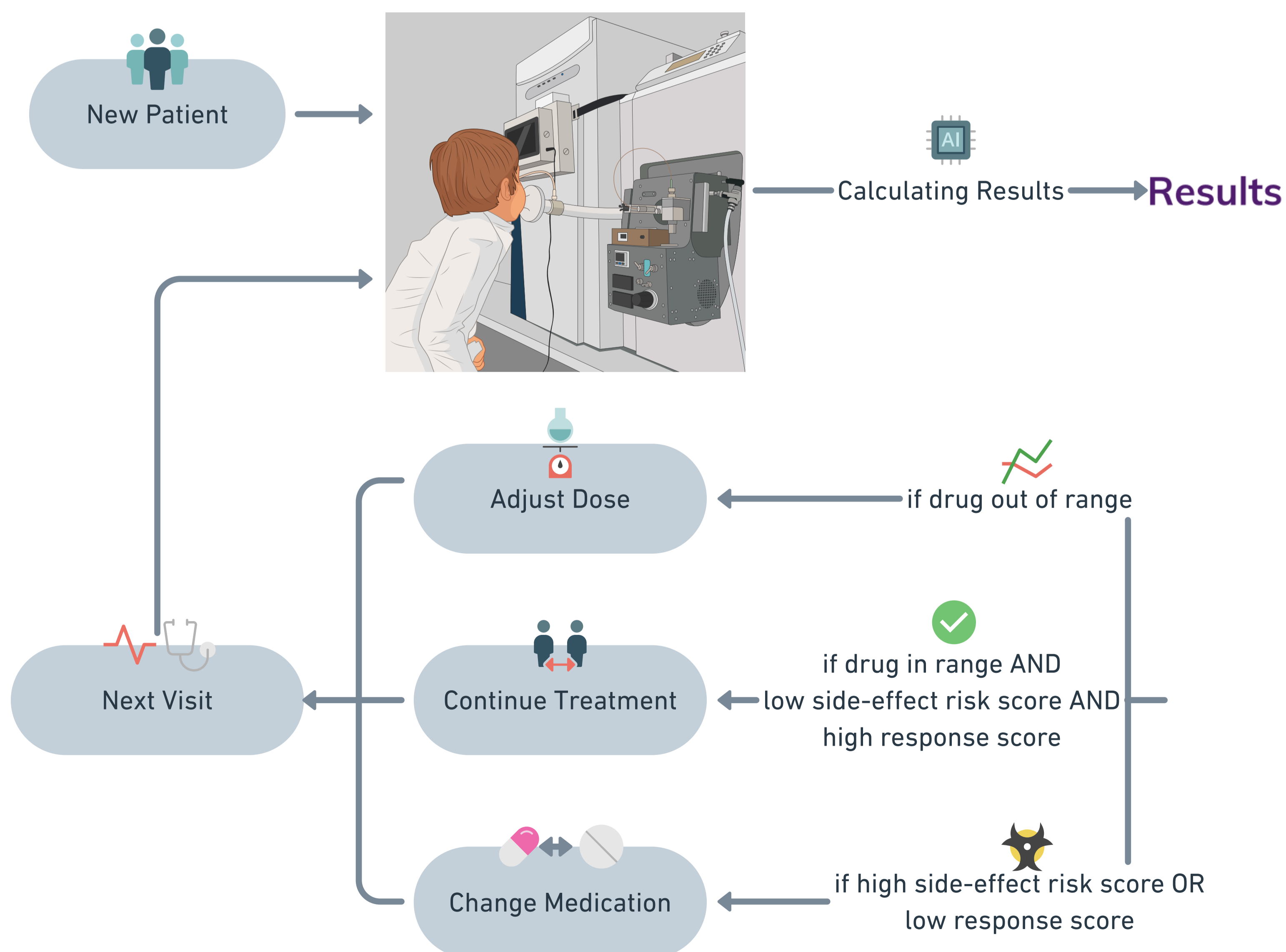
Concentration of Valproic Acid (VPA)   05-08-2020

69.0 mg/L
Total VPA

6.3 mg/L
Free VPA

Total VPA (mg/L) ⓘ   69.0 mg/L — 0 50 100 150

Free VPA (mg/L) ⓘ   6.3 mg/L — 0 5 10 15

Side effects risk score: 88 %
Response to medication score: 32 %

Patient Characteristics   ❯ See more

First Name	**Martina**	Diagnosis	**Localization-related (focal)(partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures**	
Last Name	**Mustermann**		**G40.2**	
Age	**25 years**			
Gender	**Female**	Drug(s)	**VALPROAT AbZ 500 mg**	
Weight	**60 kg**	Dose (intake)	**500 mg**	**1-0-1-0**
Height	**168 cm**	Dose (per day)	**1000 mg**	

if drug out of range

if drug in range AND low side-effect risk score AND high response score

if high side-effect risk score OR low response score