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Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich



CREATE PRIMA - SPHN Driver Project

Clinical Research from multi-modality big data sources without proprietary interfaces in a multicenter approach

Prof. Dr. med. Jörg D. Leuppi, Prof. Dr. med. Paul Hasler

Stefan Hubeli, Iterata AG

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Agenda

- CREATE PRIMA – Participants
- CREATE PRIMA
 - Introduction
 - Concepts and Principles
 - Medical Scenarios
- Research Data Governance and Result Level 1 to 4
- Timeline & Milestones
- Questions

CREATE PRIMA - Participants

Clinical Research from multi-modality big data sources without proprietary interfaces in a multicenter approach

Principal Investigator (main - applicant):

- Prof. Dr. med. Jörg D. Leuppi
- PD Dr. med. Thomas Dieterle
- PD Dr. med. Gregor Leibundgut
- PD Dr. med. Anne B. Leuppi-Taegtmeyer
- Dr. sc. Stefanie Brighenti-Zogg
- Dr. phil. Claudia Gregoriano

Co-Applicants

- Prof. Dr. med. Paul Hasler, Kantonsspital Aarau (KSA)
- PD Dr. med. Angelika Hammerer-Lercher, Kantonsspital Aarau (KSA)
- Prof. Dr. med. Michael Brändle, Kantonsspital St. Gallen (KSSG)
- Prof. Dr. med. Luca Gabutti, Kantonsspital Bellinzona (EOC)

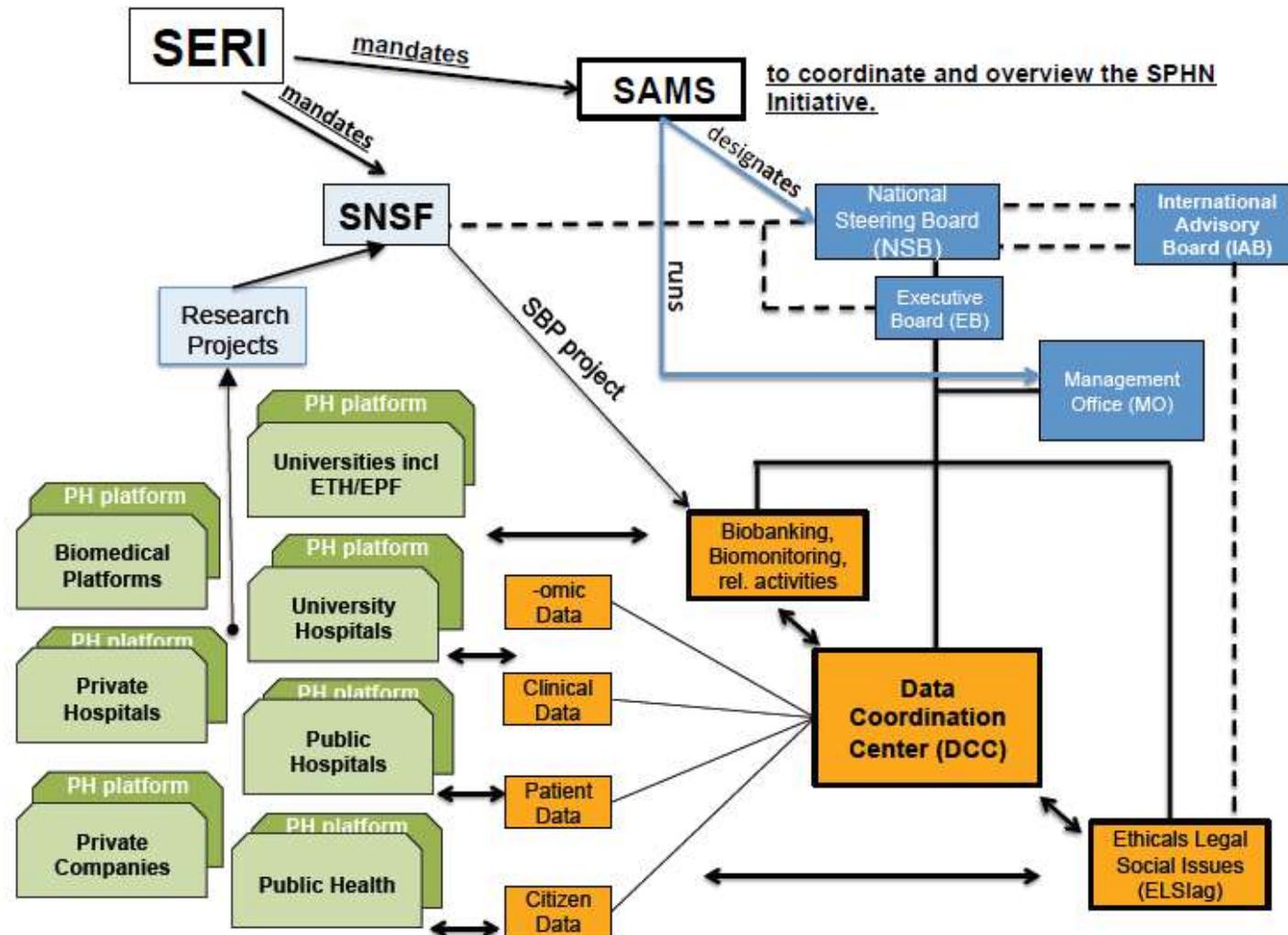
Project Partner, Iterata AG - Medical Services, Gränichen

- Stefan Hubeli, CEO Iterata AG
- PD Dr. sc.-ETH Alexander, CTO Iterata AG
- Dr. Hansjörg Lehner, Senior Consultant Iterata AG

Bei der 2. SPHN-Ausschreibung als Driver Projekt mit 1'480'050 CHF (Dauer 3 Jahre) finanziert

Schweizerische Akademie der Medizinischen Wissenschaften

Proposed organizational structure for the SPHN Initiative on three levels: national (blue), technical (orange) and institutional (green)



CREATE PRIMA Decision & Assessment

We are pleased to inform you that the NSB has decided to award your project “CREATE PRIMA – Clinical Research from multi-modality big data sources without proprietary interfaces in a multicenter approach” with a contribution of CHF 1 480 050.-- for a duration of 36 months.

Evaluation summary from the SPHN International Advisory Board (IAB)

The International Advisory Board expressed great enthusiasm for the proposed study, which is well in line with the goals of SPHN and presents a highly innovative approach to the management of complex, unstructured data.

The proposal convinced the Board in multiple ways: Firstly, the vision of the proposed work was found to be well laid out and the chosen approach a true effort at innovation. The indexing of data, rather than the moving or copying was rated very positively, as confidentiality becomes less of an issue. The Board judged the project to be original from the bottom-up as it involves the cantonal hospitals, which have a strong interface with clinical routine. The Board acknowledged the large amount of convincing preliminary data and expertise, which attest the usability of the proposed infrastructure. The clinical validation studies were rated very strong. Lastly, the Board was impressed by the applicant's clinical expertise and visionary thinking.

Despite the many merits found in the proposed study, concerns were expressed with respect to the relationship with the commercial entity involved in the project. The Board emphasized the importance of securing the technology as well as the associated IP in the long-term.

In summary, the International Advisory Board was convinced that the proposed study has the potential to significantly contribute to the overall goals of SPHN and recommended to support the application with highest funding priority, provided that the relationship with the commercial entity is clarified.

Swiss Personalized Health Network

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A project of:  SAMW ASSM

CREATE PRIMA - Introduction

Clinical Research from multi-modality big data sources without proprietary interfaces in a multicenter approach

Great opportunities linked with the concept of personalized health care (PHC)

Actual progress in developing novel diagnostic, therapeutic and prognostic strategies currently limited by factors such as

- unavailability of large clinical datasets,
- unaccessibility of these data,
- existence of data in a variety of different formats,
- predominantly unstructured form of that data,
- challenges with regards to linking different data sources for profiling individual patients or patient groups.

6 Medical Research Scenarios

+

throughout
4 connected Hospitals

+

based on
Search Capabilities and 2-speed
IT architecture

+

over massive clinical &
laboratory data sources
without copying data

The CREATE concepts and principles ...

enables business domain owners (e.g. clinicians, laboratorians, other health care professionals, hospital administrators and researchers) can access and use medical and administrative data as soon as they become available by using ultrafast and state-of-the-art **Search Technologies**.

- We **do not move data**, we send our algorithms to the data. Data always remain in their secure policy space. Searches and algorithms are applied to the data.
- We **reduce interfaces** dramatically. Expensive interfaces are drastically reduced, if not completely abolished.
- We **ensure highest level data security** through secure transmission technology, encryption and automated anonymization / depersonalization based on best-in-class solutions from the Swiss health care sector.

CREATE PRIMA - Medical Scenarios

Medical Scenarios

Characteristics of patients admitted to hospital with dyspnea - DECODE

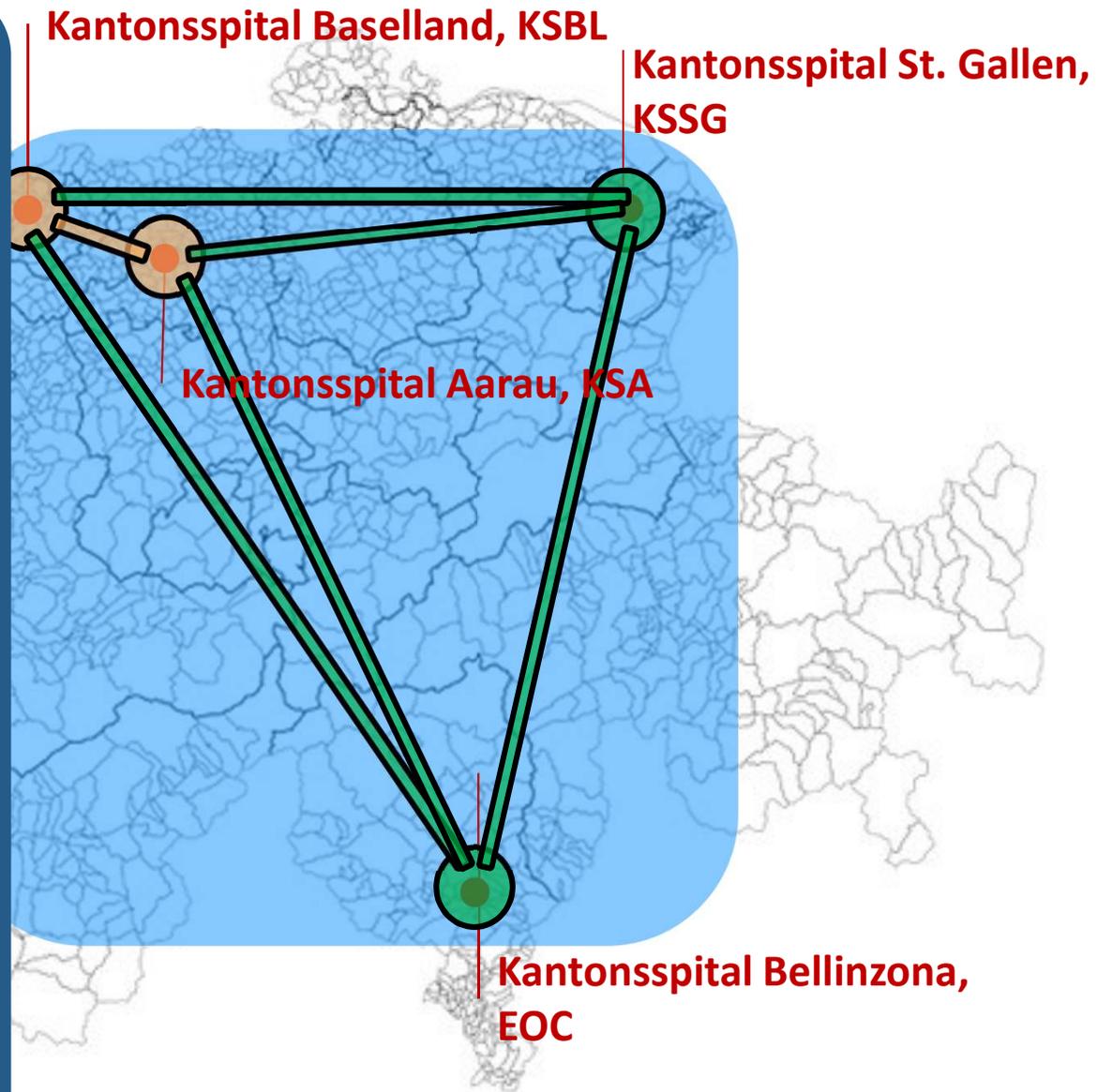
Influence of thyroid hormones on clinical presentation in patients with coronary heart disease

Identifying cases of methotrexate-induced pulmonary toxicity in a fully searchable routine clinical database

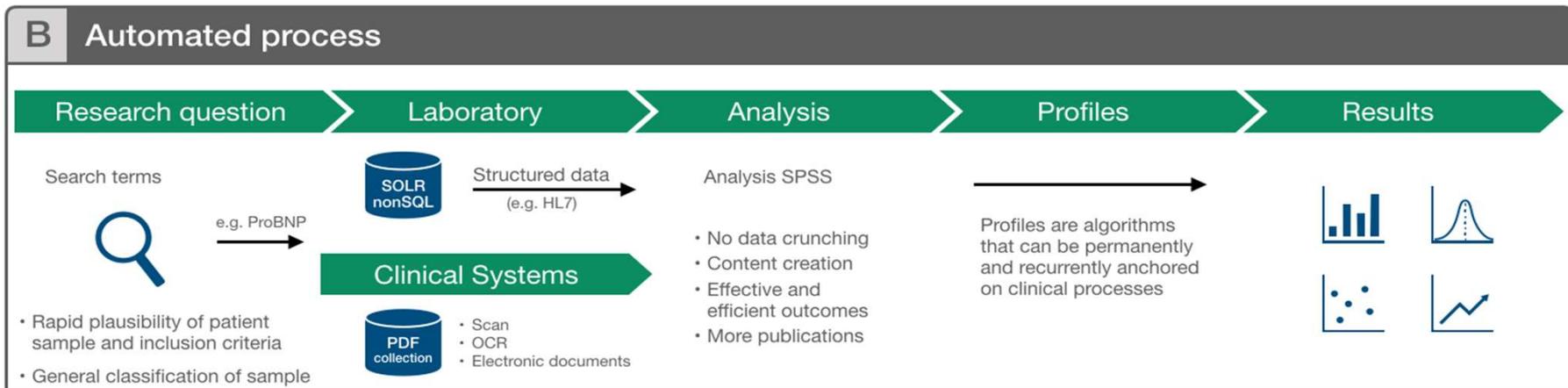
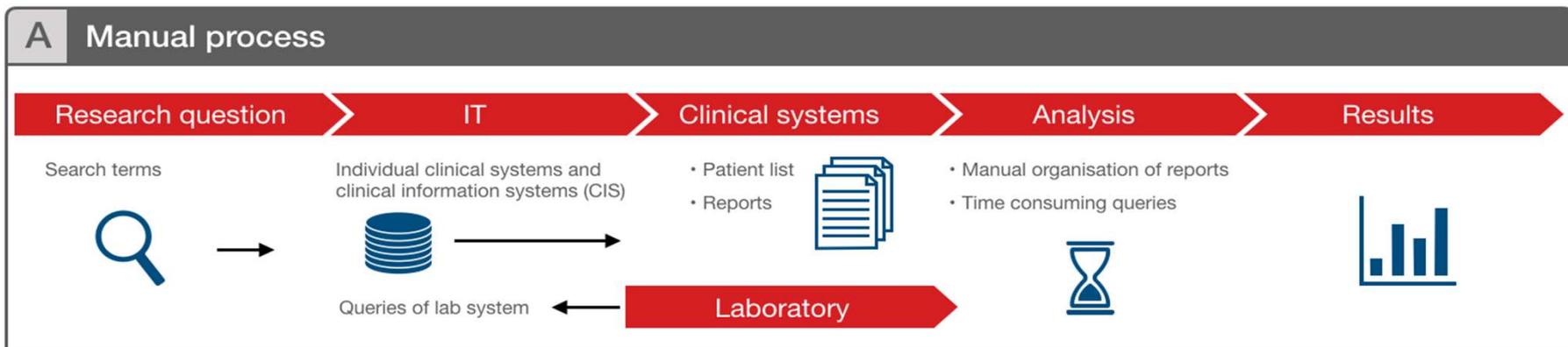
Serial point of care NT-proBNP measurements for therapy-monitoring during hospitalization in patients with acute decompensated heart failure as a therapy-monitoring during hospitalization: A prospective, unblinded, randomized controlled, pilot trial - The POC-HF Trial

General clinical practice in requesting redundant laboratory tests – Elimination of “famous twins”

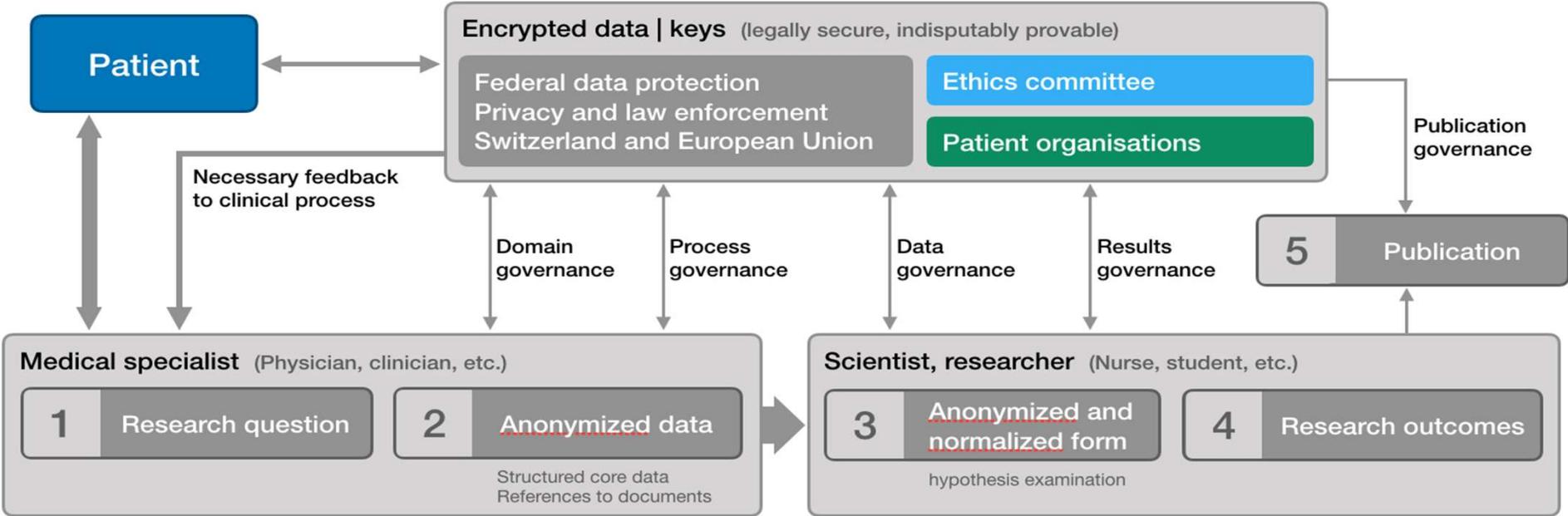
Development of a risk score to predict metamizole-induced leucopenia



Research Process



Research Governance



Research Data Governance and Result Level 1 to 4

Possible Question

Result, Feedback

Level 1



Availability of Patient Set (Sample)

- Do we have any patients with e.g.
- Steven Johnson, Lyell Syndrom?
 - Medications MTX and RA?

- *yes or no*

Level 2



Number of Patients, Groups

- Is there a significant (critical) sample size, e.g.
- How many patients have lab values for Troponin, BNP and etc.?

- *number of patients*

Level 3



Question Focused Dataset (QFD)

- Anonymized combination of a set of multi variables (study profiles, cohorts) filtered and aggregated
- Full complete research QFD e.g. demographical, age, gender distribution

- *number of patients based on QFD*

Level 4



Complete QFD for research study, agreed through patient
* patient consent is relevant

- Study monitoring
- Studies on medication interaction
- Intervention studies
- Patient support studies
-

- *patients based on QFD validated*

Timeline & Milestones

