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SMITH
Smart Medical Information
Technology for Healthcare

SMITH.
Sustainably improve Clinical Research and Patient Care.

www.smith.care

- Linking of information systems
- Use of supply and research data
- Standardized data preparation and analysis
- Personalized patient care in all areas

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MEDIZIN INFORMATIK INITIATIVE

GEFÖRDERT VOM

Bundesministerium für Bildung und Forschung

SMITH Consortium

Smart Medical Technology for Healthcare

In the medical informatics consortium SMITH, more than 300 clinical, epidemiological and systems medicine employees are working to link research and healthcare systematically for the first time. With the corresponding consent of the patients, the healthcare data routinely generated in everyday clinical practice is processed and made available for medical research in a standardized form. This enables researchers to better understand and analyse healthcare processes. Patients benefit from reliable research results, more precise diagnoses and better treatments.

The prerequisites for linking healthcare data with research data are new technical interfaces between healthcare and biomedical research at clinical sites. To this end, the 19 consortium partners are jointly establishing a data architecture that enables interoperable data use from patient care and research across the boundaries of institutions and sites. Within this framework, the university hospitals participating in the consortium have established sustainable Data Integration Centers in Aachen, Bonn, Essen, Halle, Hamburg, Jena and Leipzig. The network partners Ruhr University Bochum, the Düsseldorf University Hospital and the University Medical Center Rostock are preparing to establish a Data Integration Center. This is being done in close cooperation with the universities of Aachen, Jena and Leipzig, two non-university research institutions and four industrial partners.

About the Medical Informatics Initiative:

SMITH is one of four consortia of the Medical Informatics Initiative (MII) funded by the German Federal Ministry of Education and Research (BMBF). The Medical Informatics Initiative creates the prerequisites for bringing research and care closer together via digital technologies. In the development and networking phase (2018-2022), the BMBF is funding the establishment of Data Integration Centers at German university hospitals with more than 200 million euros. From 2023 to 2026, collaboration between university hospitals will be expanded and new partners added.

In addition, the BMBF is funding six Digital Hubs with around 50 million euros (2021-2025) as part of the MII. Their task is to bring the pioneering work of the university hospitals into other areas of the healthcare system, from ambulatory care to rehabilitation and medical aftercare.

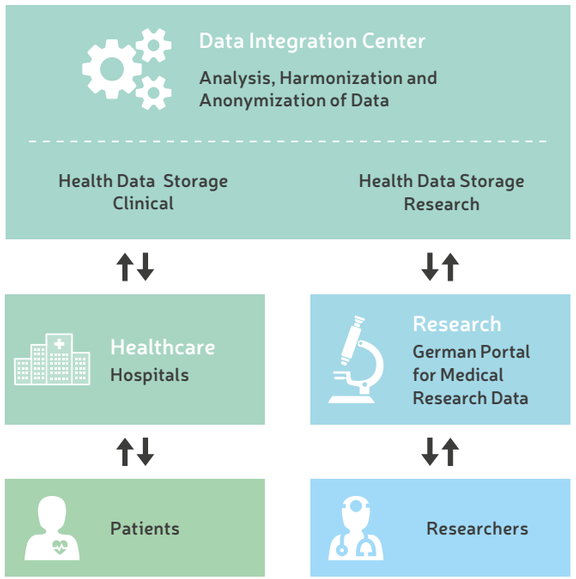
Data Integration Centers

Liaisons between Medical Research and Healthcare

Seven of the ten university medical sites participating in the consortium have established a Data Integration Center so far, and three network partners are preparing to establish one. The centers enable the cross-institutional and cross-site use of digital health data from patient care and biomedical research.

The Data Integration Centers act as intermediaries in advising on the use of data, organizing corresponding projects and facilitating the provision of data. To this end, they establish interoperable directories with quality-assured, internationally harmonized data and metadata. These are made available anonymously via a trust office. Data protection and data security have the highest priority.

The Data Integration Centers are established with an identical functionality. All centers are embedded at university medical sites with access to patient data. Within the scope of their work with clinical and research data, the Data Integration Centers contribute to the establishment of a research-compatible electronic patient record for the German health care system.



SMITH Use Cases

One methodological and two clinical use cases demonstrate the functionality and effectiveness of the Data Integration Centers in SMITH.

The Methodological Use Case

PheP - Phenotyping Pipeline supporting Clinical Evaluation Projects

In this methodological use case, the consortium is developing innovative procedures to automatically extract medical information from electronic patient records. The clinical dataset is qualitatively enriched and evaluated, scientific hypothesis generation and statistical analyses are facilitated. PheP also provides a platform for performing distributed analyses. The infrastructure created by PheP provides a basis for other use cases.

The Clinical Use Cases

ASIC - Algorithmic Surveillance in Intensive Care

With the ASIC Use Case, SMITH promotes the improvement of patient care through the use of available clinical routine data. This is demonstrated by the example of the treatment of patients with Acute Respiratory Distress Syndrome (ARDS), a disease that currently still causes the death of around 40 percent of all affected patients. The ASIC App developed for this purpose serves as an early warning system by alerting healthcare professionals to potential ARDS.

HELP - Guideline-based Use of Antibiotics in Infectious Medicine

The Use Case HELP focuses on the targeted, guideline-based use of antibiotics for the early control of staphylococcal bloodstream infections. The aim is to support treating physicians in normal and intensive care units in their infectious disease treatment decisions. In this way, the control of these bacterial infections can be improved and antibiotic resistance can be reduced.

Added Value

Integration of Research and Healthcare

Since 2018, the SMITH Consortium has been working as part of the Medical Informatics Initiative (MII) to digitally network patient data routinely generated in everyday clinical practice across sites and make it accessible to clinical and biomedical research. The data allows researchers to analyse and understand diseases more precisely and promotes the advancement of scientific knowledge.

Improving individual Patient Care

The targeted networking of research and healthcare contributes to patients benefiting more quickly from validated research results, receiving more precise diagnoses and better treatments. Additionally, new and individualized treatment procedures can be developed, and diseases can be detected earlier.

Promoting a new Culture of „Data Sharing“

Within the framework of the MII, SMITH is significantly involved in the creation of a nationwide uniform data access and data exchange of patient data and biomaterials. In addition to technical harmonization, this primarily involves the creation of uniform organizational and legally secure framework. Data protection and data security have the highest priority.

Involving Patients actively

Patients can explicitly approve the use of their data for the purposes of medical research by signing a consent form. The consent to having their data used is formulated in general terms and can be revoked at any time without giving reasons. Voluntary consent is currently possible in the context of treatment at the participating university hospitals.

Strengthening Teaching and Research in Medical Informatics

Specialists are needed to make large amounts of data from medicine and healthcare usable for tailored diagnostics and treatments. SMITH brings together the expertise and experience gained in various educational formats. New professorships, junior research groups and structured teaching programs are being established.

Partners

Aachen	RWTH Aachen University University Hospital RWTH Aachen *
Berlin	ID Information & Documentation in Health Care
Bochum	Ruhr University Bochum
Bonn	University Hospital Bonn *
Dortmund	Fraunhofer Institute for Software and Systems Engineering
Düsseldorf	Düsseldorf University Hospital
Essen	Essen University Hospital * März Internetwork Services AG
Freiburg	Averbis GmbH
Halle	University Hospital Halle (Saale) *
Hamburg	University Medical Center Hamburg-Eppendorf *
Jena	Friedrich Schiller University Jena Jena University Hospital *
Jülich	Jülich Research Center
Leipzig	Leipzig University University of Leipzig Medical Center *
Leverkusen	Bayer AG
Rostock	University Medical Center Rostock

** site with Data Integration Center*