


Center for Sepsis
Control & Care 



Using i2b2 as a Research Data Warehouse in the Center for Sepsis Control and Care (CSCC) Jena

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Concept of IFBs



Integrated Research and Treatment Centres (IFB)

- Center for Stroke Research Berlin, Charité Universitätsmedizin Berlin
- Integrated Research and Treatment Centre Transplantation (IFB-Tx), Hannover Medical School
- Centre of Chronic Immunodeficiency (CCI), University Medical Centre Freiburg
- Integrated Centre for Research and Treatment of Vertigo, Balance and Ocular Motor Disorders, LMU, Munich
- Integrated Research and Treatment Centre Adiposity Diseases, Leipzig University
- Centre for Sepsis Control and Care, University Hospital Jena
- Centre for Thrombosis and Hemostasis of the Johannes Gutenberg University Mainz
- Comprehensive Heart Failure Centre, University Hospital Würzburg

Integrated Research and Treatment Centres, funded by BMBF

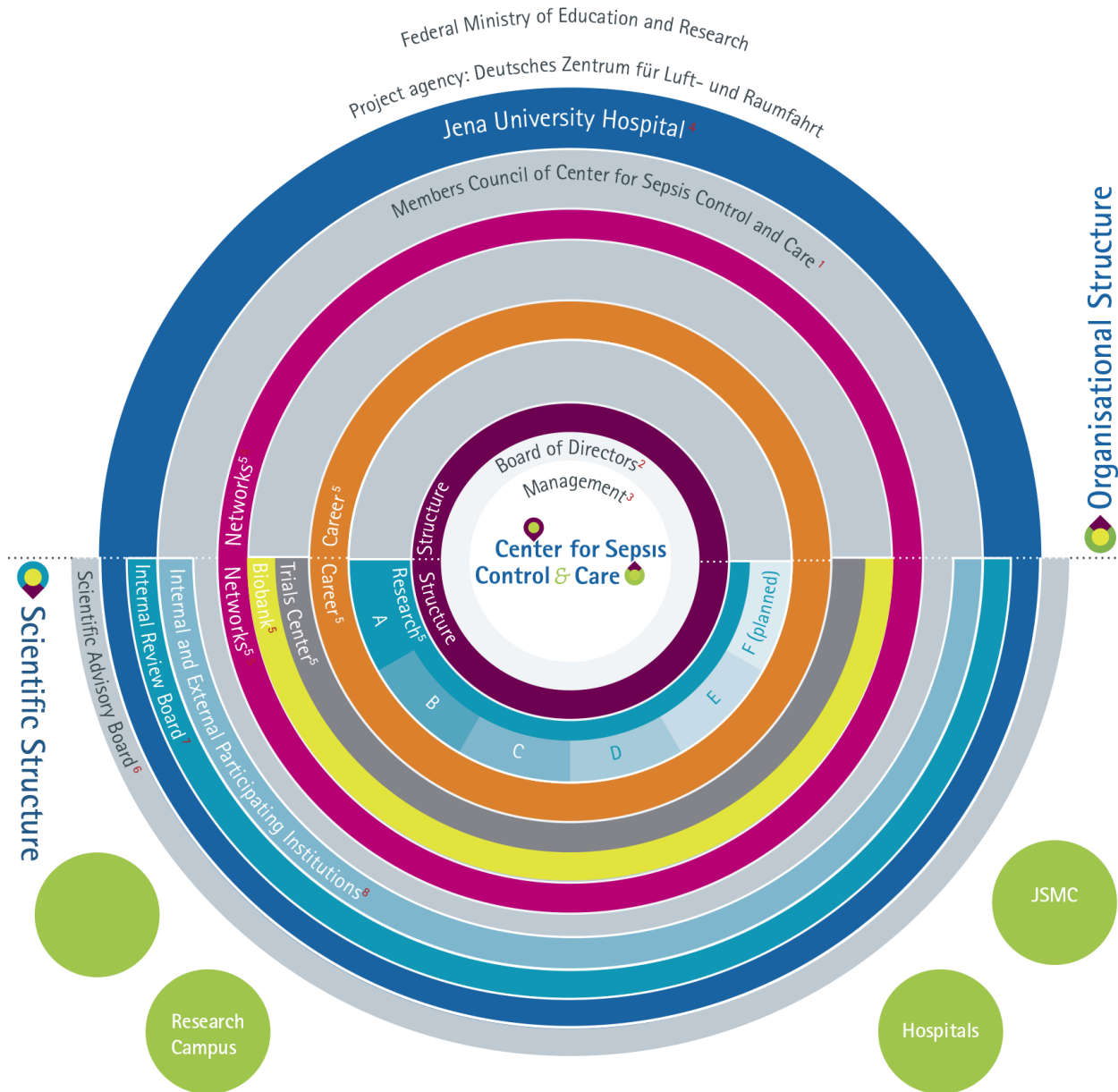
- supporting closer links between research and the treatment of patients in important areas of diseases
- intended to sharpen the profile of the medical faculty and the university hospital.
- strengthen exchanges between basic and patient-related clinical research.

provide stronger support for junior scientists and by offering more attractive career prospects.

Suitable interdisciplinary organizational structures must be developed which can effectively support these aims.

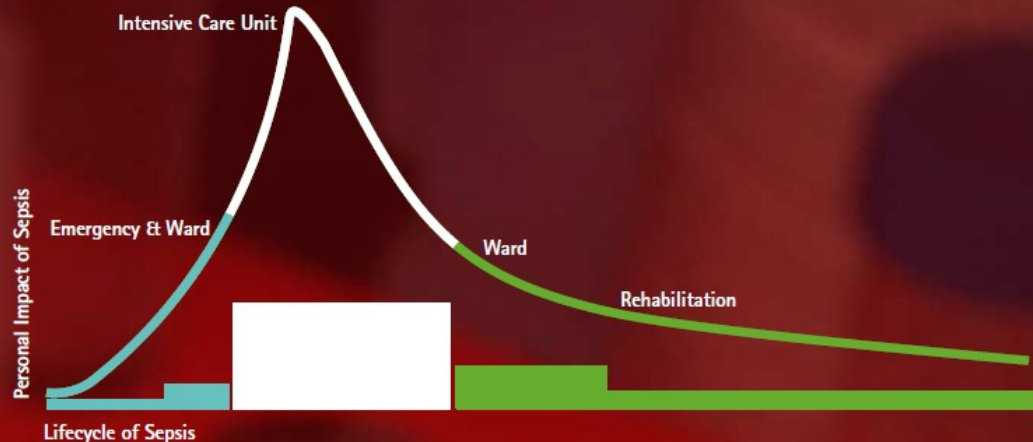
A total of eight candidates are receiving funding (25 Mill over first 5 yrs funding period):

Structure of CSCCC



Research Areas

Research

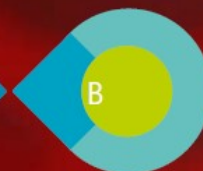


Research Area



Risk Assessment and Sepsis Control

39_Alerts
41_Cost-Alerts
42_Anti-biofilm
44_CNV
45_Osarst
46_Peiras
47_Pred-Sep



Novel Diagnostic Tools and Approaches

49_Action
50_Aras
51_CanSep
52_Inprot
54_Lab-Alerts
56_Spade
58_Transseptomics



Acute Care

60_Eidecs
63_Medusa
64_PCT-Diagnostics
65_PCT-Therapy



Sepsis related Organ Failure

67_ADAMTS13
68_Candida
70_HHDP
72_HIFMORG
74_Liver Dysfunction
75_Phosphatidylcholine
77_Pi3Kgamma
78_Praise
79_Rosisep
80_Seda
81_Sephi
88_SMAD2
83_SomatostatinR
84_Thrombomodulin



Long-term Sequelae

86_Anergy
88_Crisis
90_Loss
92_Loss-Cog-Train
93_Neuro Pain
95_NeuroSOS-Dysphagia
96_NeuroSOS-Enc
97_NeuroSOS-Nerve/CIP
99_Recuperate
100_SepMech
101_Smooth

Focus of IT

Basic research

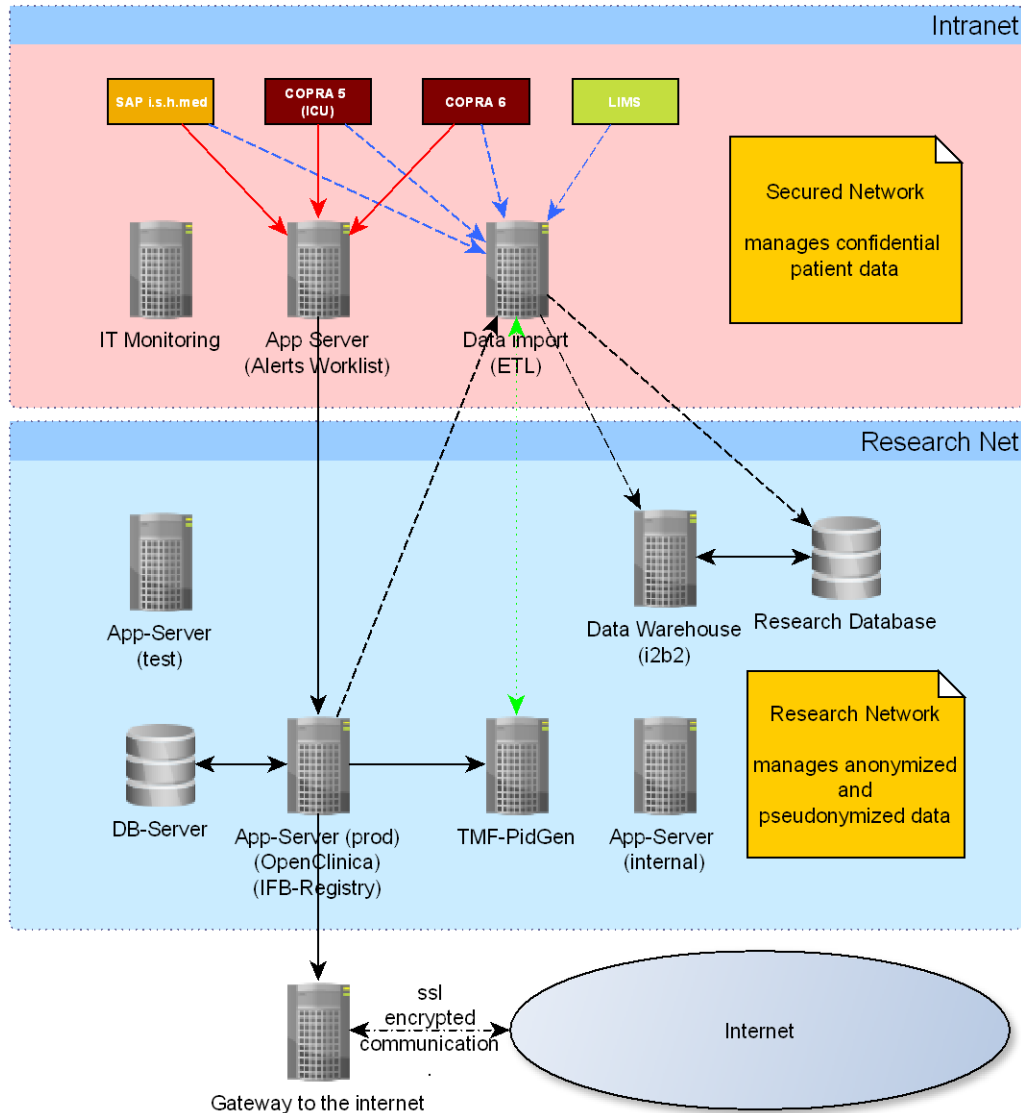
- suitable infrastructure
- advice

Clinical trials

- Support in screening
- Data acquisition
- Later data retrieval
- Provide data to biometricians
- Outline to study investigators



IT Structure



- VMWare Cluster
- CentOS 6.4
- Mostly OpenSource
- Webapps
- Focused on data privacy

Clinical Systems

▶ MIS:	SAP is-h med* / BI	Datasource active
▶ PDMS:	Copra5 / Copra6	Datasource active
▶ LIS:	SWISSLAB	Datasource dev
▶ RIS/PACS:	Cerner	Datasource planning

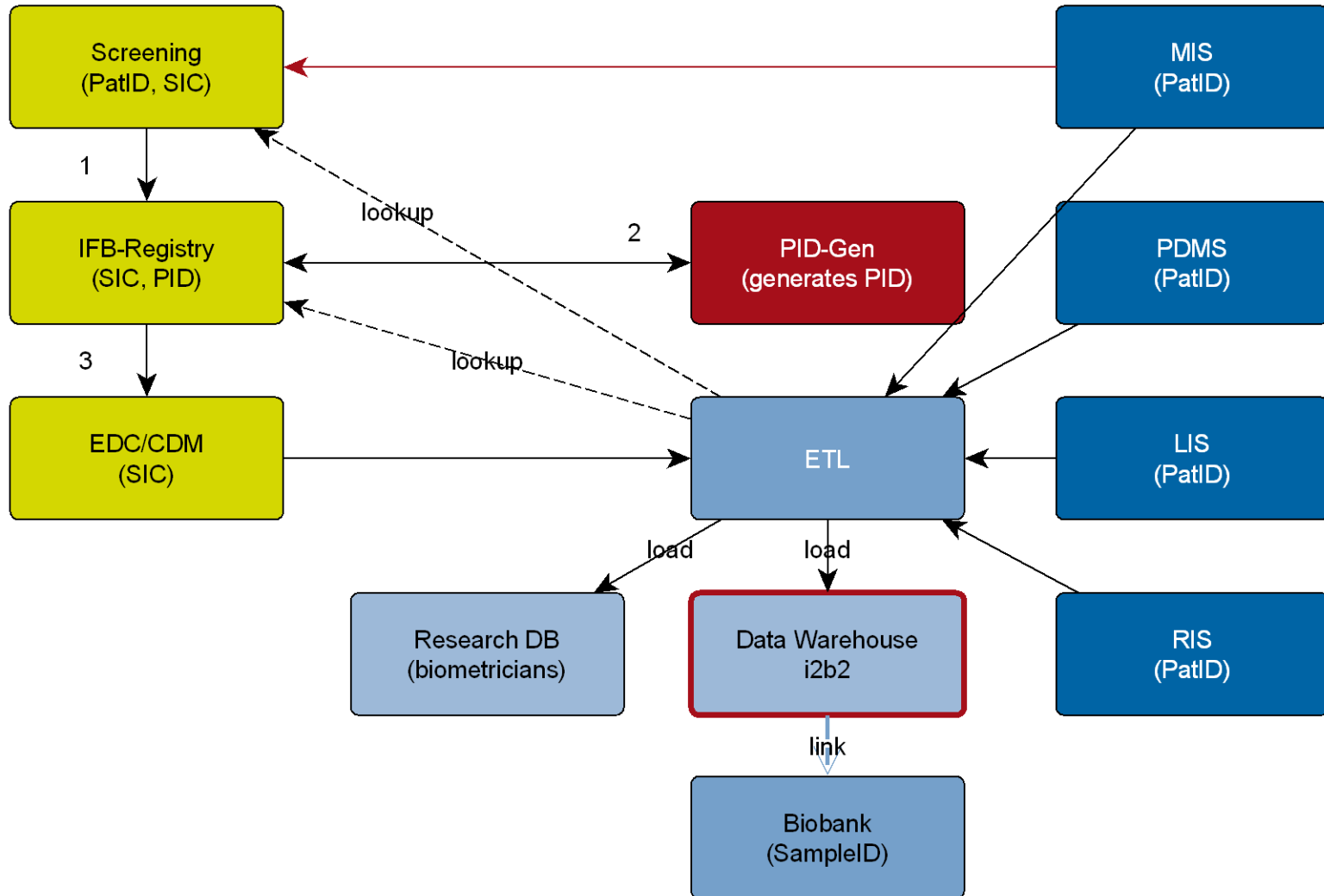
Study-Systems

▶ Screening:	custom app	online
▶ Randomtool:	custom app	work in progress
▶ Pseudonymization:	TMF-Pidgen + custom app	online
▶ EDC/CDM:	OpenClinica 3.0	online

Dataintegration / -presentation

▶ ETL:	Talend open studio	online
▶ Research DB:	plain PostgreSQL	work in progress
▶ Statistics:	i2b2	work in progress

Data Flow



Clinical Studies (excerpt)

15 clinical studies, 1 AMG study, 1 meta study

Registry

- ▶ Register of all JUH-patients with severe sepsis or septic shock
- ▶ 2 events, 137 items
- ▶ 840 probands, 111018 values

Medusa

- ▶ Multicenter, cross-sectional study (48 centers)
- ▶ Patients with severe sepsis or septic shock
- ▶ 3 events, 139 items
- ▶ 3839 probands, 280108 values

Alerts

- ▶ Hospitalwide observational study (26 wards)
- ▶ Patients with nosocomial infections
- ▶ Automated pre-screening
- ▶ 6 events (4 repeating), 228 items
- ▶ 5177 probands, 266503 values

Installation

- ▶ Many dependencies
- ▶ Only successful after analyzing Mr Mate's wizard

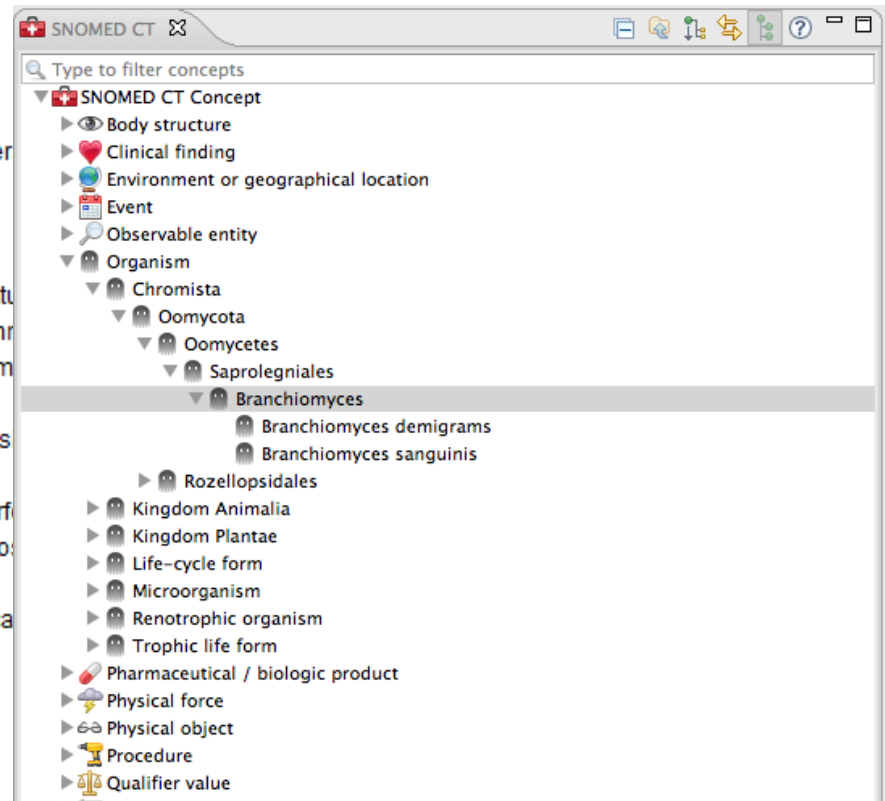
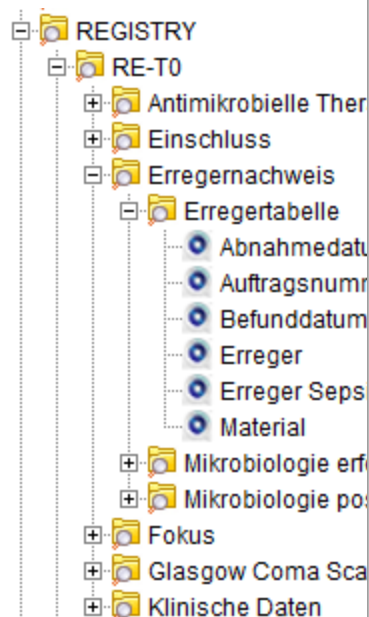
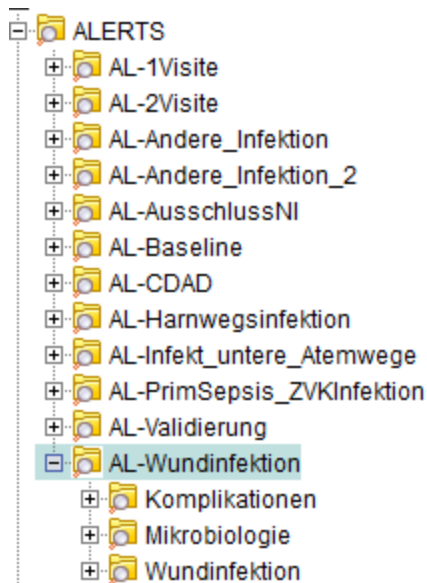
Maintenance

- ▶ Lack of structured documentation
- ▶ Best practice?
 - ▶ Create new Project
 - ▶ Staging (Dev -> Test -> Prod)
 - ▶ ETL
 - ▶ ...

i2b2 - ... and matters (1)

„The best ontology“

- Study-Structure driven?
Study -> Site -> Event -> CRF -> Section ->Item
- General ontology?
Vital Sign -> Cardio -> Pressure -> Systolic -> Invasive
- Both?



Mapping of „dependent“ facts

- ▶ Antibiotics resistance:
material, germ, antibiotic -> only combination describes result
- ▶ Is modifier-pattern a solution ?

Usecases

- ▶ Feasibility checks
- ▶ Datamining?

S. E. Brosette, A. P. Sprague, J. M. Hardin, K. B. Waites, W. T. Jones and S. A. Moser: "**Association Rules and Data Mining in Hospital Infection Control and Public Health Surveillance**", "J. of the American Medical Information Association", 1998, 5, 373{381.

Useability

- ▶ Export of Facts/Patients?

Architecture

- Better administration
- Cheaper database
- Complete toolstack (including ETL)

Maintenance

- Structured documentation
- Best practice

Usability

- Tutorials
- Generated description of datasets
- Export?



Thank you
for listening

