

Information Infrastructures and multiple logics: a case from heart transplants

11 Sept 2017

Information Infrastructures

- Sociotechnical
 - Information systems and information artefacts, standards, people, work practices, routines, organization of work...
- Shared resources
 - Support many kinds of work practices for heterogeneous groups of users

Work practices and infrastructures

- The focus in this study: complex work practice
- Articulation work vs primary work
 - E.g. how doctors document their practices while they are ‘practicing’
- Infrastructures are «transparent to use»: they become visible when something does *not* work

methodology

- Ethnography of work
- Data collected via observations, interviews, analysis of information systems/artefacts and other documents
- 'follow the actor' to map the information infrastructure

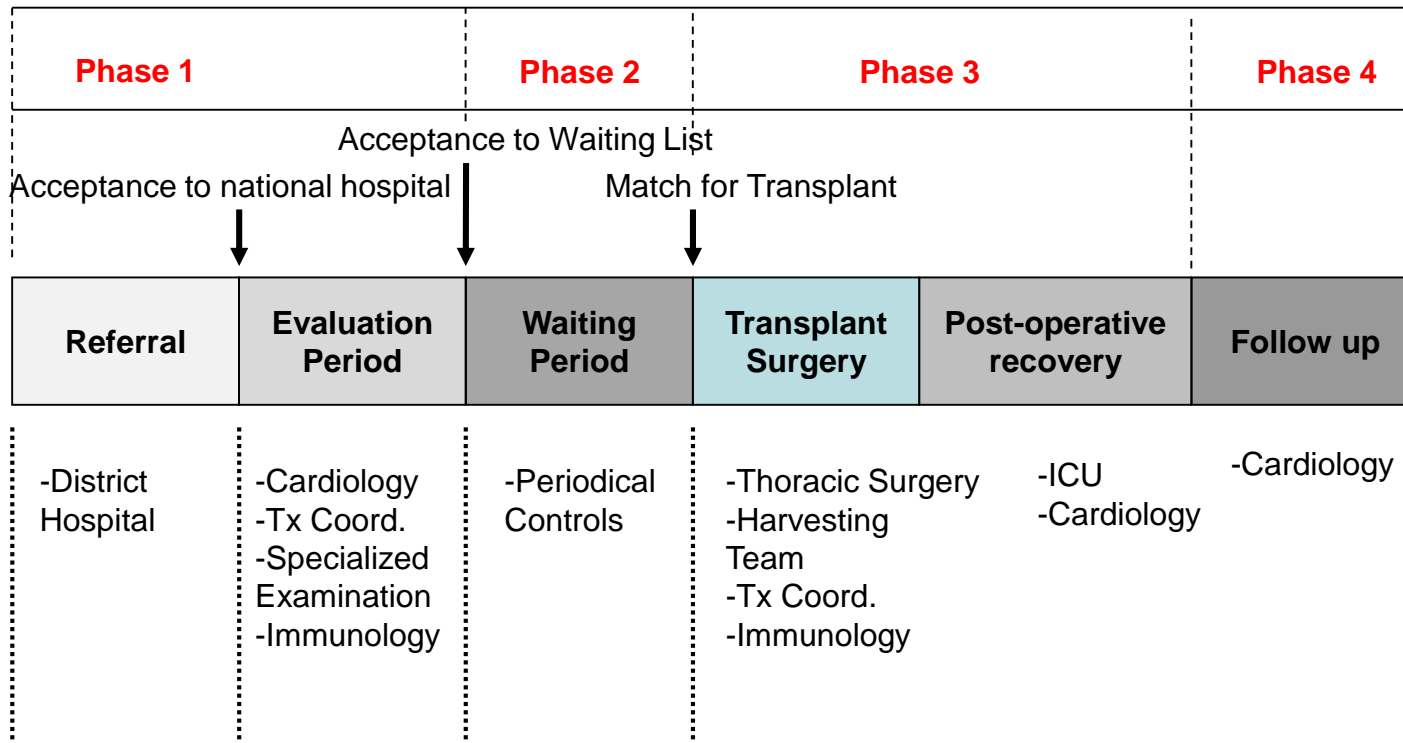
content

- Short introduction to heart transplants
- Description of heart transplant as a process – the patient trajectory
- Description of the core work practices in relation to information work and main information systems and information artefacts
- The perspective of the different departments – how they communicate with each other
- Logics of information use – how the same information infrastructure supports different kinds of 'collective' work practices



Heart transplant process

- Distributed work process
 - Within the hospital (no transplant center)
 - Across hospitals
 - Across levels of care
- Interdisciplinary process
 - Cardiology: identification of recipients
 - Thoracic surgery: surgical procedure and donation process
 - Immunology: immune response – HLA typing
 - Other competences: e.g. organ preservation techniques
- Before/after surgery: complex process of information production, collection, selection, use



PHASES OF THE TRANSPLANT PROCESS

Referral

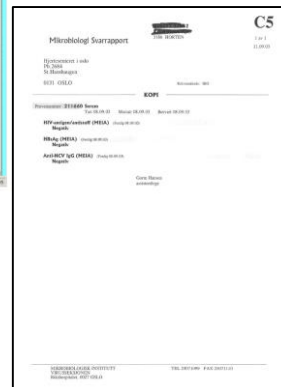
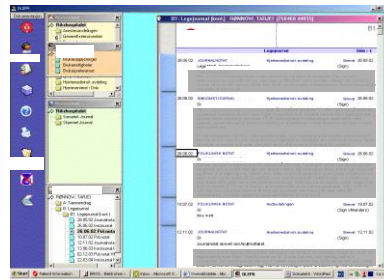
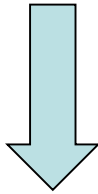
Evaluation
Period

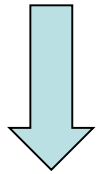
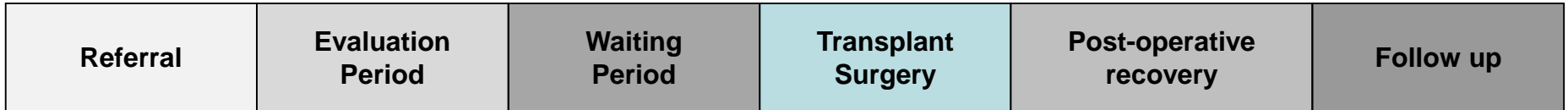
Waiting
Period

Transplant
Surgery

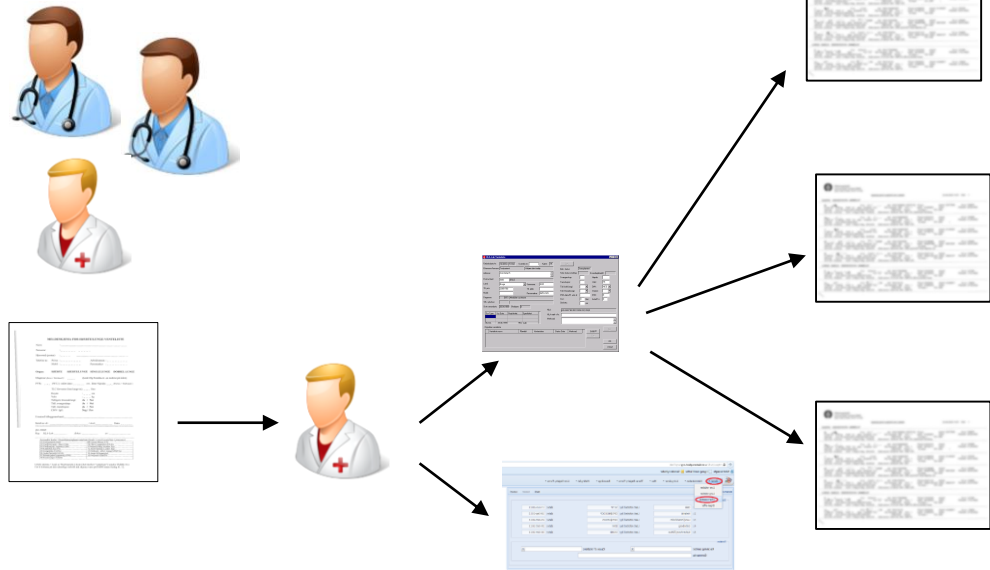
Post-operative
recovery

Follow up

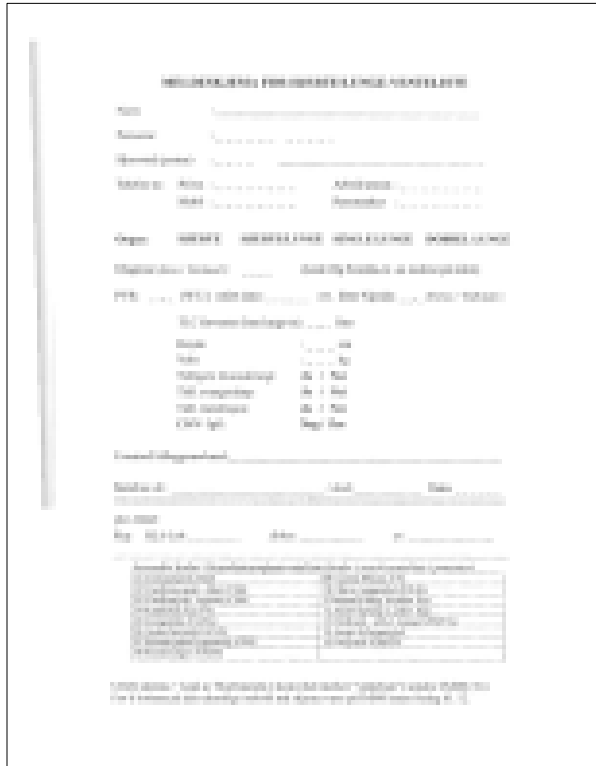




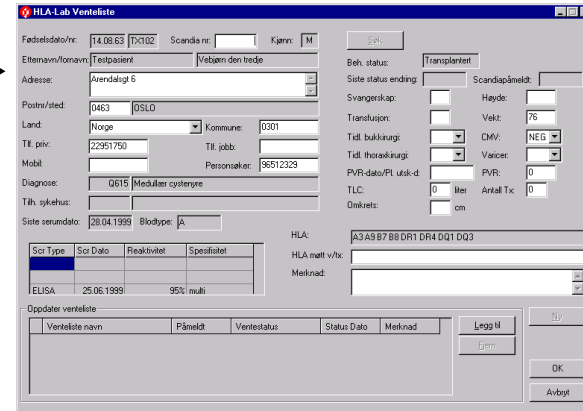
Heart Meeting



Paper form of acceptance on the WL



Waiting list data entry screen in Nyrebase/HLA Lab



Paper printout of the WL from Nyrebase/HLA Lab



Data on the waiting list:

- Name, Personal Number, Address, Telephone (private, work, mobile), Beeper, Scandia transplant number
- High, Weight, PVR (pulmonary vascular resistance) and date, TLC (total lung capacity), previous thoracic surgeries and date
- ABO, HLA (antigens), CMV (cytomegalovirus), pregnancies, transfusions,

.....

HLA-Lab HLA-typing

Labløpenr: 002
 Fødselsdato/nr:
 Problemstilling:

Etternavn/fornavn:
 CMV:

HLA-type:

Kontrollert dato/av:
 Blodtype:

Kommentar:

Std. kommentar:
 Autolog T Celler:
 B Celler:

Bestilte oppdrag

HLA-type	Bestilt	Plate nr.
S-KL I		X
S-KL II		X

HLA-typing

HLA - A	HLA - B	HLA - C	HLA - DR	HLA - DQ
A1	B12		DR4	DQ3
A2	B35		DR8	

Tidligere HLA-typing

	002	A	A1 A2 B12 B35 DR4 DR8 DQ3	
	005	A	A1 A2 B12 B35 DR4 DR8	

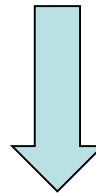


Name	Last visited by	Date
1. Home	10/10	10/10/2010
2. About Us	10/10/2010	10/10/2010
3. Services	10/10/2010	10/10/2010
4. Contact Us	10/10	10/10/2010
5. Home	10/10	10/10/2010

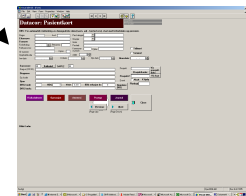
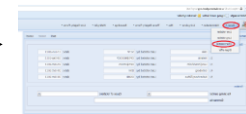
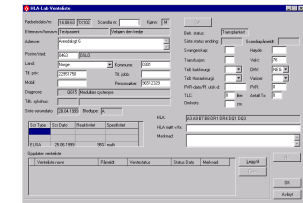
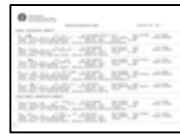
Creating center:

Class of center:

Comments:



Matching recipient and donor



Transplant registers



Visual dBASE - [Form]

File Edit View Form Properties Window Help

Datacor: Pasientkort Opprettet: _____
Sist endret: _____

OBS: For automatisk innhenting av demografiske data (navn, adr., bosted osv), start med fødselsdato og personnr.

Regnr: _____ Avd: _____ Pas.kategori: _____

Etternavn _____ Gruppe: _____

Fornavn _____ Gate: _____

Fødselsdag: _____ Personnr: _____ Postadr: _____

Fullt personnr: _____ Kommunenummer: _____ Fylke: _____ Tidlmort

ID-nummer: _____ Kjønn: _____ Senmort

Oppholdskode: _____ Alder: _____ Morsdato: _____

Inn-dato: _____ Ut-dato: _____ Opr.dato: _____

Euroscore 0 **Kalkuler!** SAPS2 0

Diag.nr (ICD10) _____ **Prosjekt** _____ **Vis prosjekt-data**

Diagnose _____ **Prosjekt2** _____ **Vis kun**

Op.koder _____ **Event** Akutt Hjelp

Oper _____ **Planlagt** _____

DRG kode _____ **HDG** 0 **Vekt** 0.00 **80% refusjon kr:** 0 **Oppdater DRG**

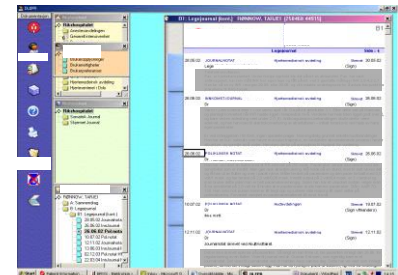
DRG beskr. _____

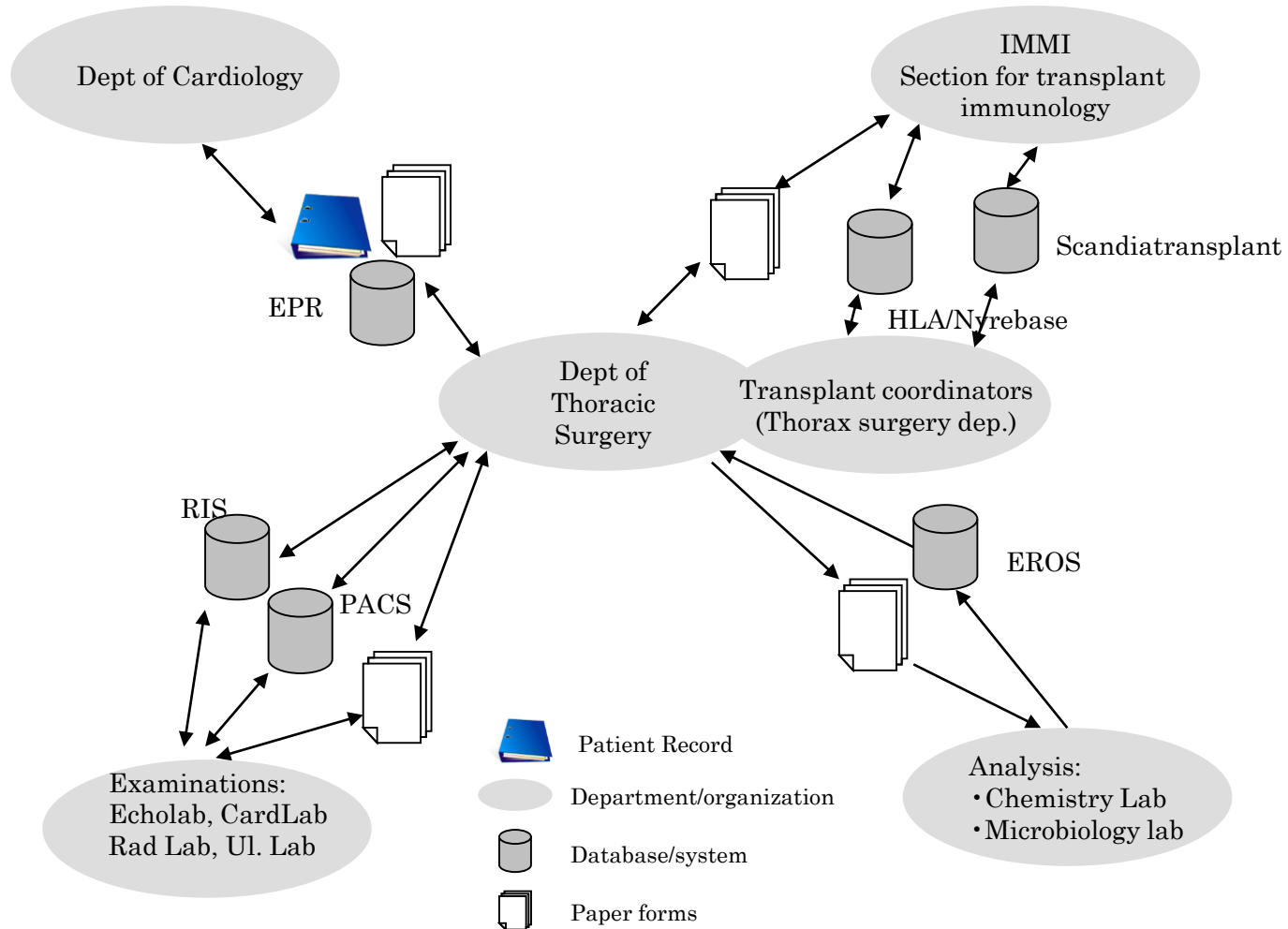
Risikofaktorer **Operasjon** **Anestesi** **Postopr** **Journal** **Close**

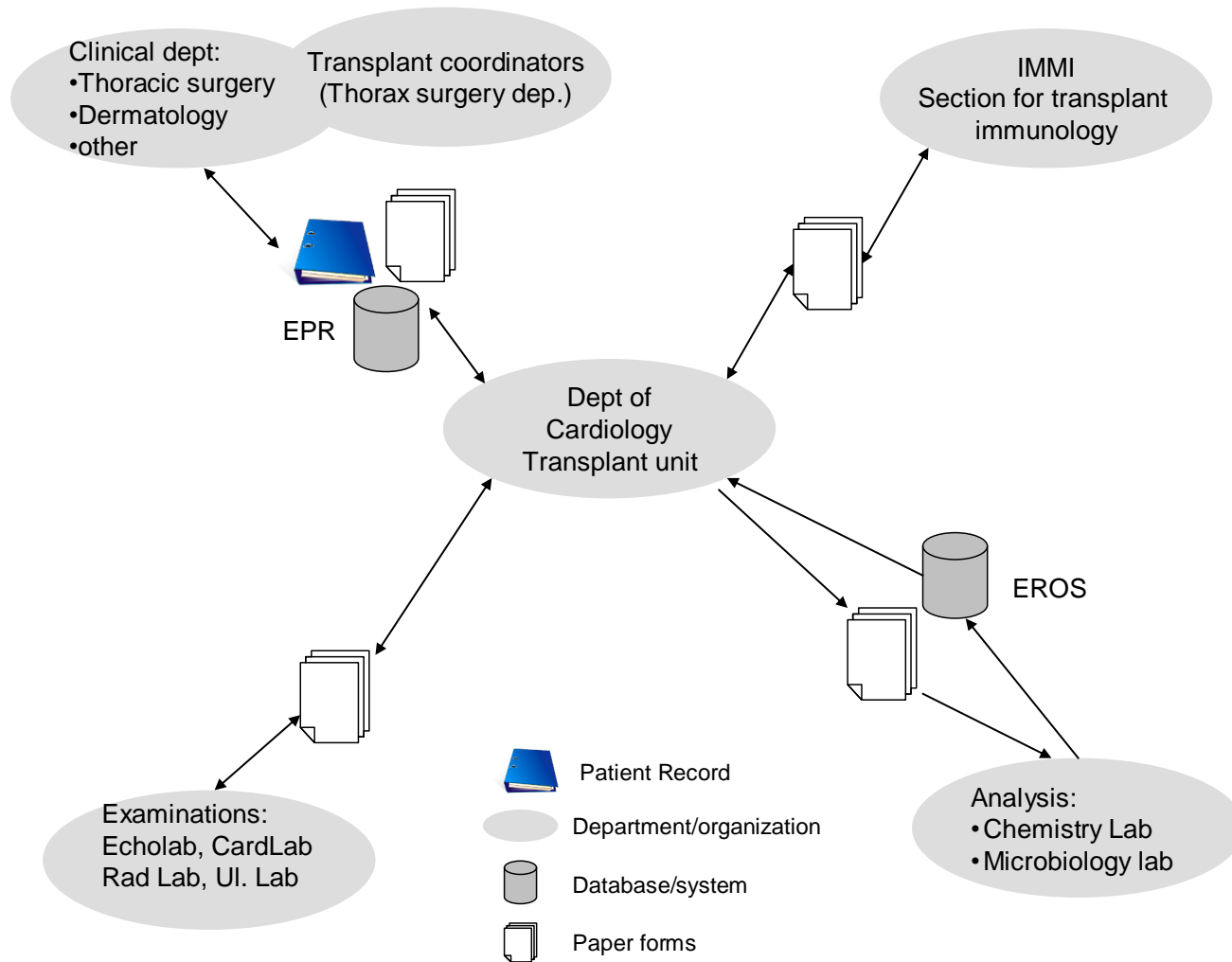
Previous (Page Up) **Next** (Page Down)

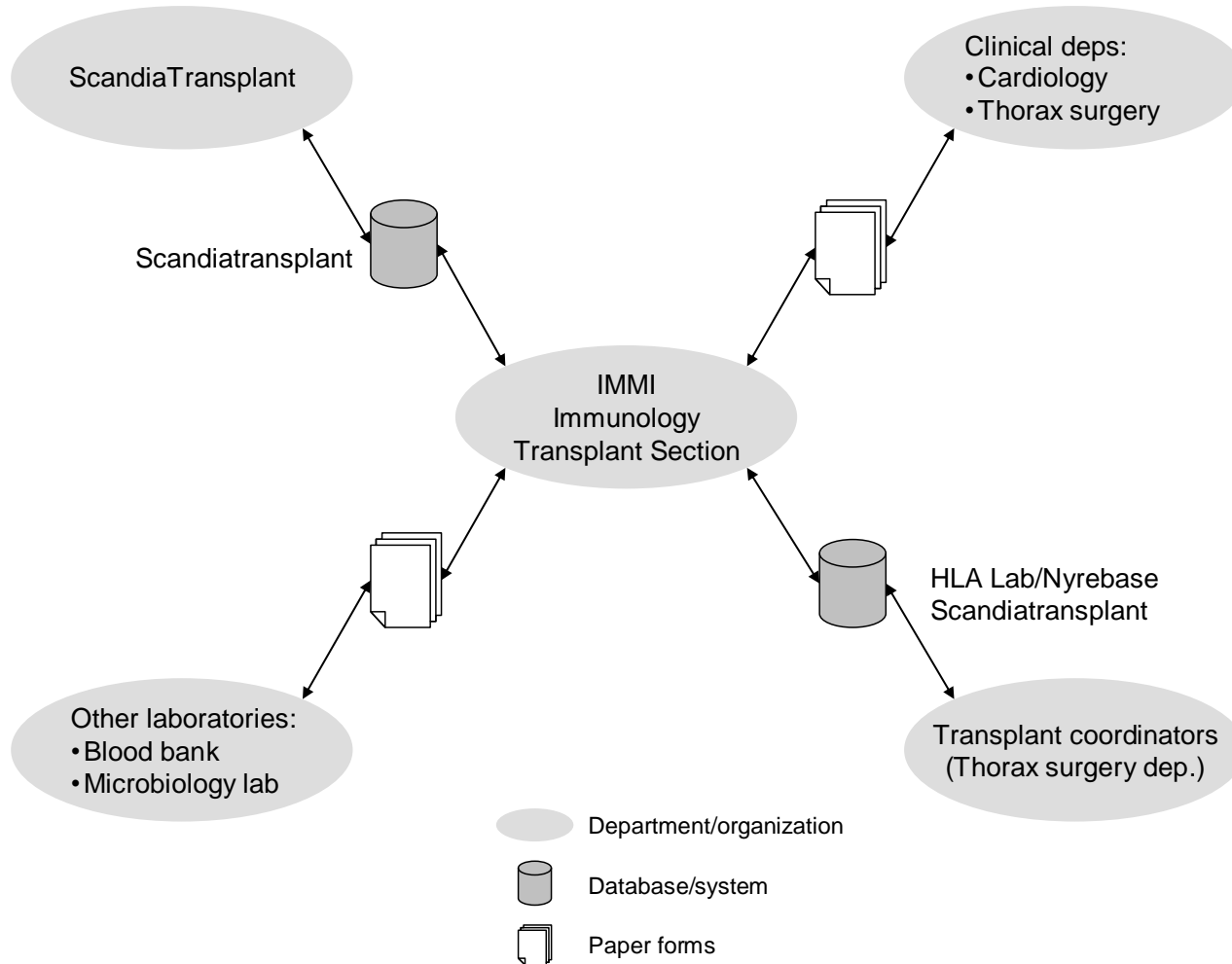
Euroscore calculation

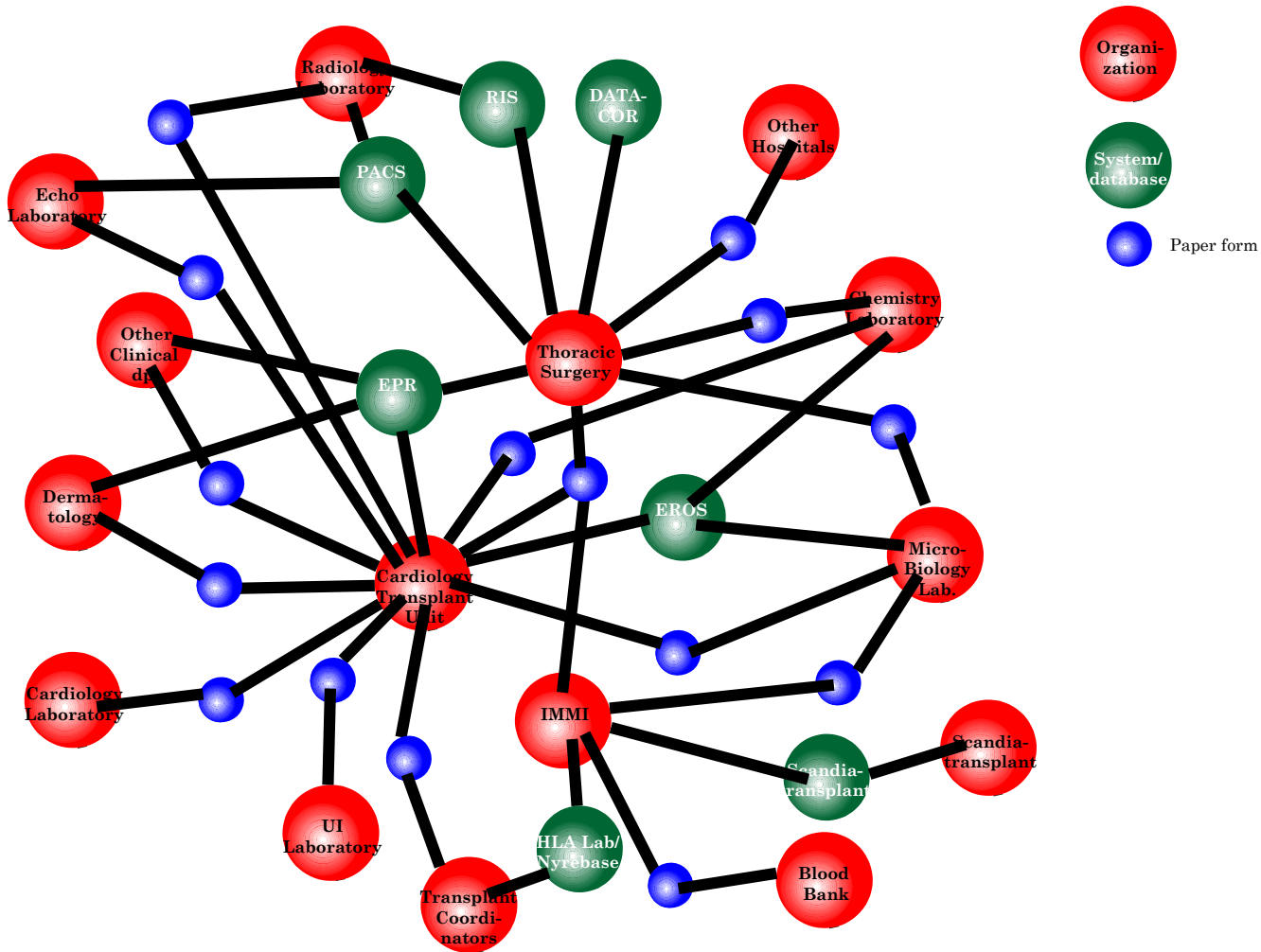
Bilde1.wfm











Logics of information use

1. Patient-centered logic
 2. Treatment-centered logic
 3. Activities-centered logic
 4. Event-centered logic
- Multiple logics of *Information ordering*
 - Multiple effects

Patient-centred logic

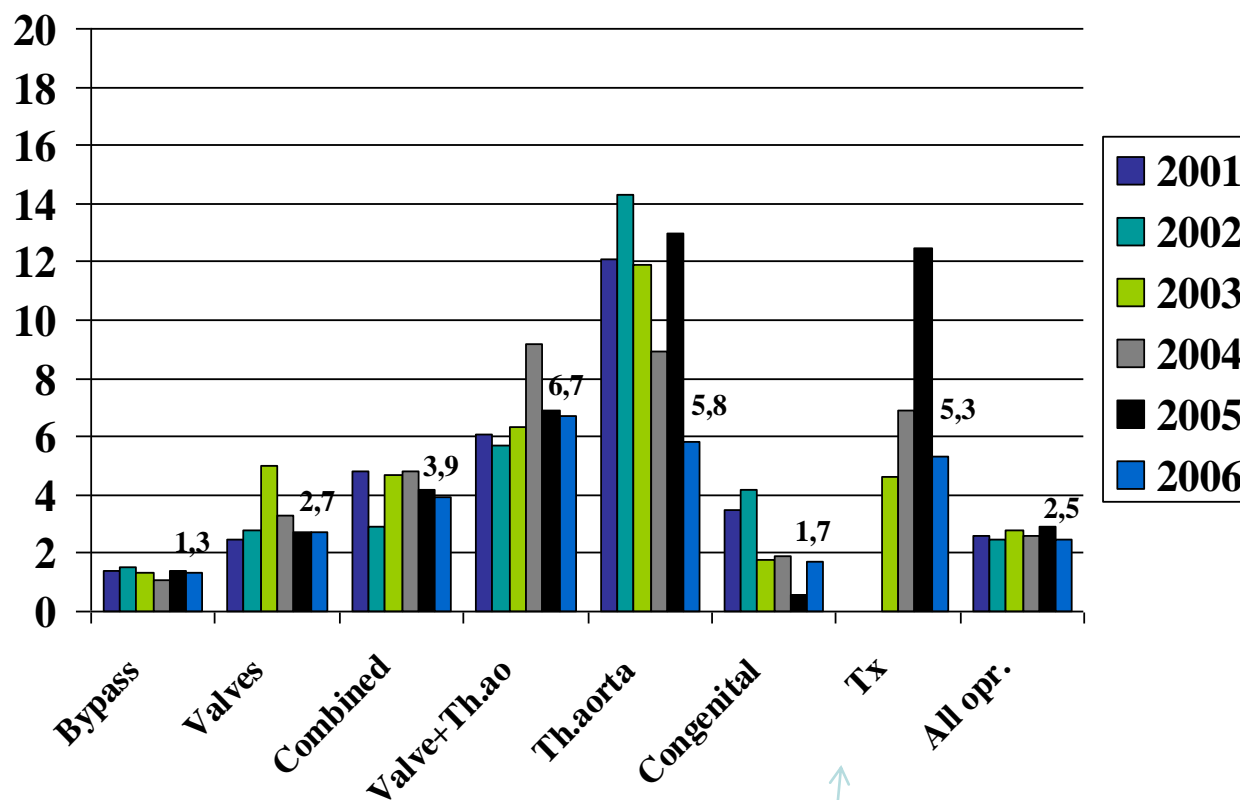
- Medical history of each singular patient
- Chronological order
- Supports the work of:
 - Understanding what has been done, what results, what are the next steps
 - Connecting recipient and donor
 - Main information artefacts: checklists across shifts, EPR, referrals
- Does not support: integration of work across disciplines

«The patient has been at the medical department previously. In March 1989 the diagnosis has been of a dilated cardiomyopathy (...) The patient has been previously evaluated at (...) and in principle he is accepted for transplant. The patient is hospitalized because he has been lately feeling unwell...on the day of hospitalization the patient had pain in the head ...»

Treatment-centred logic

- HTx as specific treatment
- Category of patient
- Not identities of patients but aggregated data
- Supports the work of:
 - Monitoring the quality of the process
 - researchers
- Main information artefacts: EPR as source of info, Datacor, personal databases, Scandiatransplant
- Located in meetings, conferences, research articles, scientific community

Heart operations in Norway 2006 - 30-day mortality (%)



heart transplant surgeries

«from 1983 to 1999 317 heart transplants have been performed, an average of 23 transplants per year, 82% of the recipients were males, 50% had heart failure due to coronary heart disease. The survival rate after one and ten years is 85% and 53% respectively with a significant higher survival rate among recipients younger than 50 at transplant, especially if the graft was from a donor younger than 35 years»

«in 2000 there was a discussion because Norway had exported a high number of livers. Usually they export about 10 per year, but in 2000 it was up to 35. Thus the board decided that Norway should be refunded from the recipients' hospitals for the all the medical equipment used like liquids or machines to treat bodies and organs before the surgery»

Activities-centered logic

- Concurrent tasks and patient trajectories
- Logistic issues.
- Supports the articulation work for managing many patients:
 - Different schedules for the same day,
 - Same stage, different places (WL)
- Organize movements in time and space of many patients
- Main information artefacts: Daily patient list in departments, weekly plans

Event-centered logic

- Heart transplantation as *surgical procedure*
- Specific event
- Supports the work of
 - Minimizing uncertainties
 - Two directions:
 - Define as much as possible temporal and spatial boundaries of the transplant surgery
 - Rely on flexibility of schedules and plans
- Main information artefacts: donation plan, waiting list

Oppbevares i pasientens journal – kopi hos transplantasjonskoordinator, lokal AMK sentral og pasier



Rikshospitalet
Thoraxklinikken

Transportplan ved innkalling av hjerte-, hjerte/lunge- og lungerecipienter til transplantasjon

Venteliste

Hjerte

Hjerte/lunge

Lunge

Navn

Født

Adresse

Postnr.

Sted

Telefon privat

Mobiltelefon

Personsøker

Andre :

Lokalsykehus

Pt. innlagt

Telefon

Div

Ovenfor nevnte pasient er i dag påmeldt til transplantasjon. Han/hun er utstyrt med personsøker og kan bli innkalt til Rikshospitalet for transplantasjon på kort varsel.

I utgangspunktet benyttes ordinære rutegående kommunikasjonsmidler. Ambulanse for pasienter i sentrale Østlandsområdet.

Pasienter som kalles inn til transplantasjon skal ha absolutt prioritet på rutefly. I de fleste tilfeller har de med ledsager. Flyselskapets plassjef kontaktes ved problemer.

Pasienter som innkalles til lungetransplantasjon vil være avhengig av kontinuerlig surstofftilførsel under hele transporten.

Four co-existing logics

1. Patient-centered logic

- Information ordered chronologically,
- Makes visible the medical history of each patient
- Checklists across shifts, EPR, referral
- Not integrating disciplines and professions

2. Treatment-centered logic

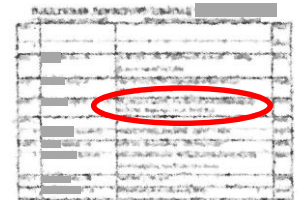
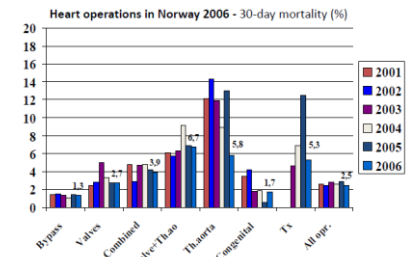
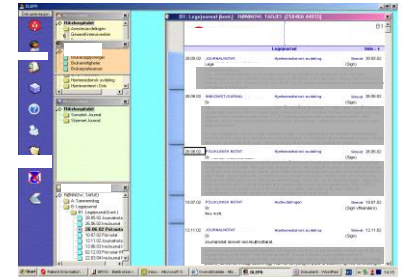
- Information is aggregated (no identity of patient)
- Makes visible heart transplant as specific treatment
- Specific category of patients
- Quality parameters, risk factors

3. Activity-centered logic

- Information is organized to care for many patient trajectories
- Organize movements in time and space of many patients
- Daily patient list in departments, weekly plans

4. Event-centered logic

- Information is organized to define as much as possible temporal and spatial boundaries of the transplant surgery
- Heart transplantation as surgical procedure
- Minimize uncertainties; Donation plan, waiting list



Dokumentasjon i pasientens journal - best hos transplantasjonssenteret, lokal ABM ABM og pasient

Transplantasjon ved innstilling av hjerte-, hjertelunge- og lungetransplanter

Vertikalitet: Hjertelunge Lunge

Alm: _____ Født: _____

Jufnr: _____

Ans: _____

Telesjef: _____

Mottakelse: _____ Pasientnummer: _____ Andre: _____

Lokasjon: _____

Spes: _____

Overfor denne pasient er i dag planlagt 0 transplantasjon. Resten av utført med pasienter som kan bli innlagt i transplantasjon for transplanterings til den neste.

I tillegg til dette finnes enkelte utvalgte kommunikasjonsgrupper. Anbefales for pasienter i venteliste til transplantasjon.

Pasienter som ikke er i venteliste kan ha alvorlige sykdommer på utført i den beste tilfelle for de med venteliste. Flytteplanen planlagt fremtiden ved gjennomføring av denne prosessen. Flytteplanen planlagt fremtiden ved gjennomføring av denne prosessen.

Conclusion

- Many reasons for 'working' with information in an organization
 - Produce, collect, store, retrieve, share etc.
- Work practices and the use of information are linked in complex way
- No single 'logic'
 - E.g. not sufficient to have a patient trajectory logic, there are many other legitimate needs
- The case shows:
 - 'sociotechnical' quality of infrastructures
 - 'shared' quality of infrastructures
 - And the complexities they generate