Information Infrastructures and multiple logics: a case from heart transplants

05 Sept 2016

‘Boring things’ and infrastructures

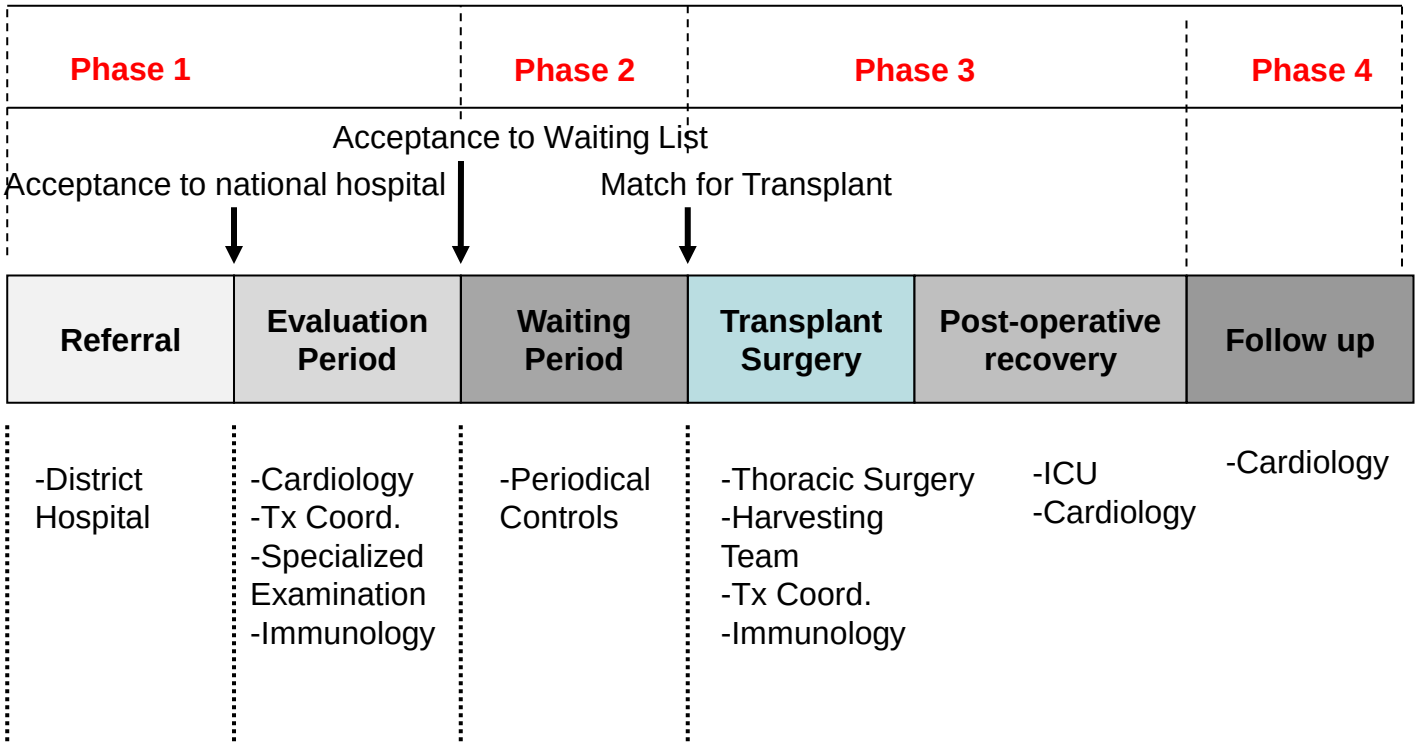
- The focus in this study: the ‘boring things’
- Articulation work vs primary work
  - E.g. how doctors document their practices while they are ‘practicing’

- Infrastructures are «transparent to use»: they become visible when something does *not* work

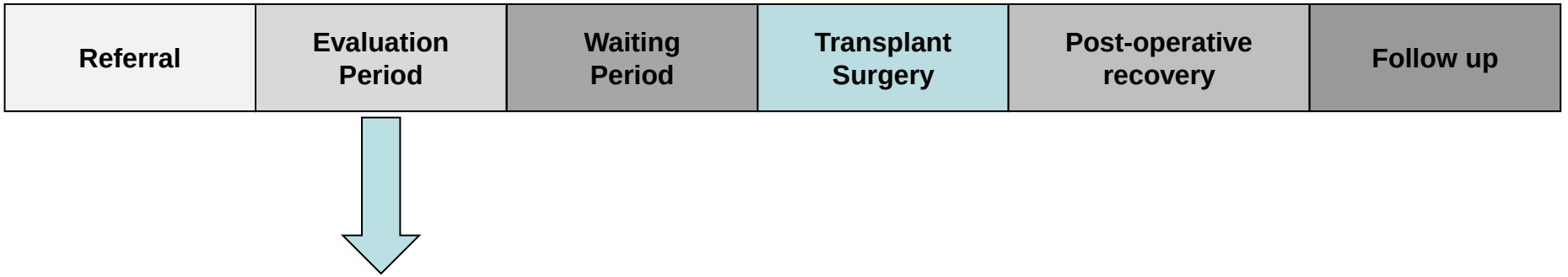
HEART
TRANSPLANT
IN
PROGRESS

Heart transplant process

- Distributed work process
  - Within the hospital
  - Across hospitals
  - Across levels of care
- Interdisciplinary process
  - Cardiology: identification of recipients and donors
  - thoracic surgery: surgical procedure
  - Immunology: immune response
  - Others: e.g. organ preservation techiques
- Before/after surgery: complex process of information production, collection, selection, use



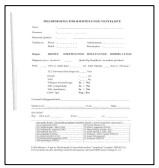
PHASES OF THE TRANSPLANT PROCESS

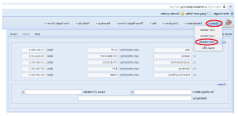


- Patient record
- Electronic Patient Record
- Paper and electronic forms with Results from visits

Referral	Evaluation Period	Waiting Period	Transplant Surgery	Post-operative recovery	Follow up

Heart Meeting



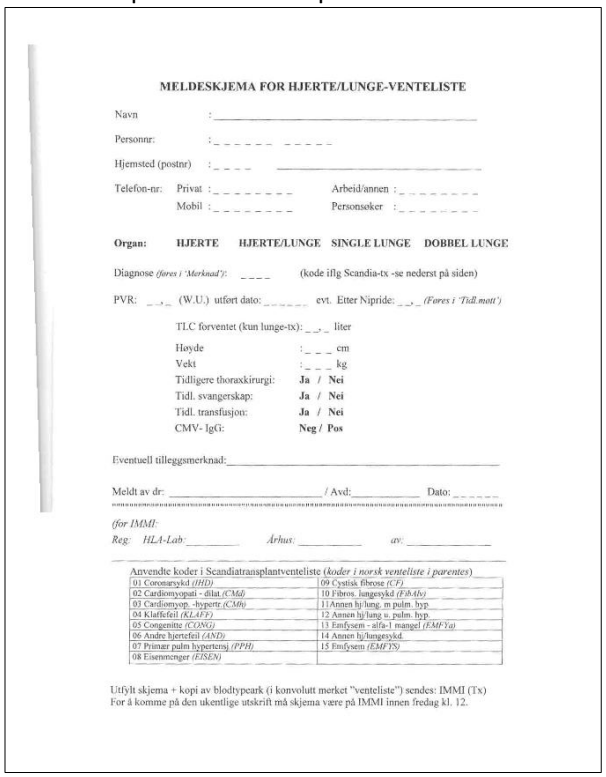


Waiting list print out

Waiting list print out

Waiting list print out

Paper form of acceptance on the WL



MELDESKJEMA FOR HJERTE/LUNGE-VENTELISTE

Navn : _____

Personnr: : _ _ _ _ _ _ _ _ _ _ _ _

Hjemsted (postnr) : _ _ _ _ _____

Telefon-nr: Privat : _ _ _ _ _ _ _ _ Arbeid/annen : _ _ _ _ _ _ _ _

Mobil : _ _ _ _ _ _ _ _ Personsøker : _ _ _ _ _ _ _ _

Organ: HJERTE HJERTE/LUNGE SINGLE LUNGE DOBBEL LUNGE

Diagnose *(føres i 'Merknad')*: _ _ _ _ (kode iflg Scandia-tx -se nederst på siden)

PVR: _ _,_ (W.U.) utført dato: _ _ _ _ _ _ evt. Etter Nipride: _ _,_ *(Føres i 'Tidl.mott')*

TLC forventet (kun lunge-tx): _ _,_ liter

Høyde : _ _ _ cm

Vekt : _ _ _ kg

Tidligere thoraxkirurgi: **Ja / Nei**

Tidl. svangerskap: **Ja / Nei**

Tidl. transfusjon: **Ja / Nei**

CMV- IgG: **Neg / Pos**

Eventuell tilleggsmerknad: _____

Meldt av dr: _____ / Avd: _____ Dato: _ _ _ _ _ _

(for IMMI:

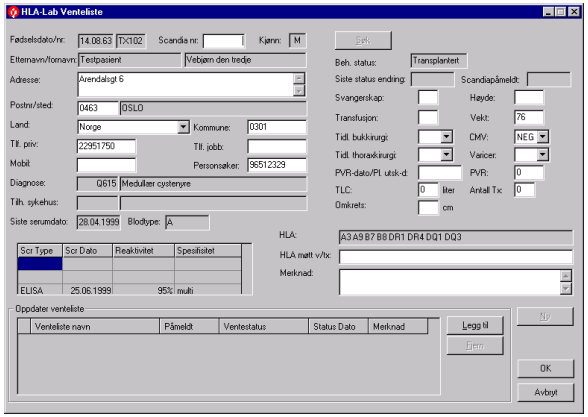
Reg: HLA-Lab: _____ Århus: _____ av: _____

Anvendte koder i Scandiatransplantventeliste *(koder i norsk venteliste i parentes)*

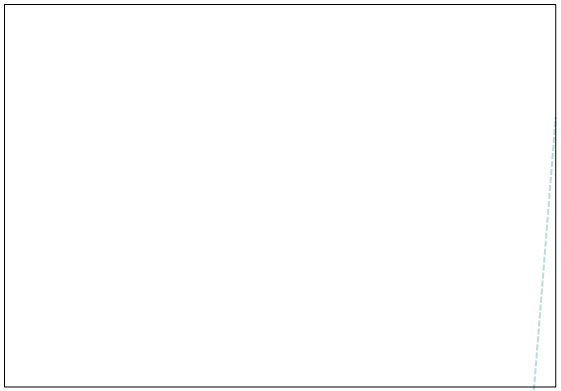
01 Coronarsykd *(IHD)*	09 Cystisk fibrose *(CF)*
02 Cardiomyopati - dilat *(CMd)*	10 Fibros. lungesykd *(FiMdy)*
03 Cardiomyop. -hypertr *(CMh)*	11 Annen hj/lung. m pulm. hyp.
04 Klaffefeil *(KLAFF)*	12 Annen hj/lung u. pulm. hyp.
05 Congenitta *(CONG)*	13 Emfysem - alfa-1 mangel *(EMFYa)*
06 Andre hjertefeil *(AND)*	14 Annen hj/lungesykd.
07 Primær pulm hypertensj *(PPH)*	15 Emfysem *(EMFYS)*
08 Eisenmenger *(EISEN)*	

Utfylt skjema + kopi av blodtypeark (i konvolutt merket "venteliste") sendes: IMMI (Tx)
For å komme på den ukentlige utskrift må skjema være på IMMI innen fredag kl. 12.

Waiting list data entry screen in Nyrebase/HLA Lab



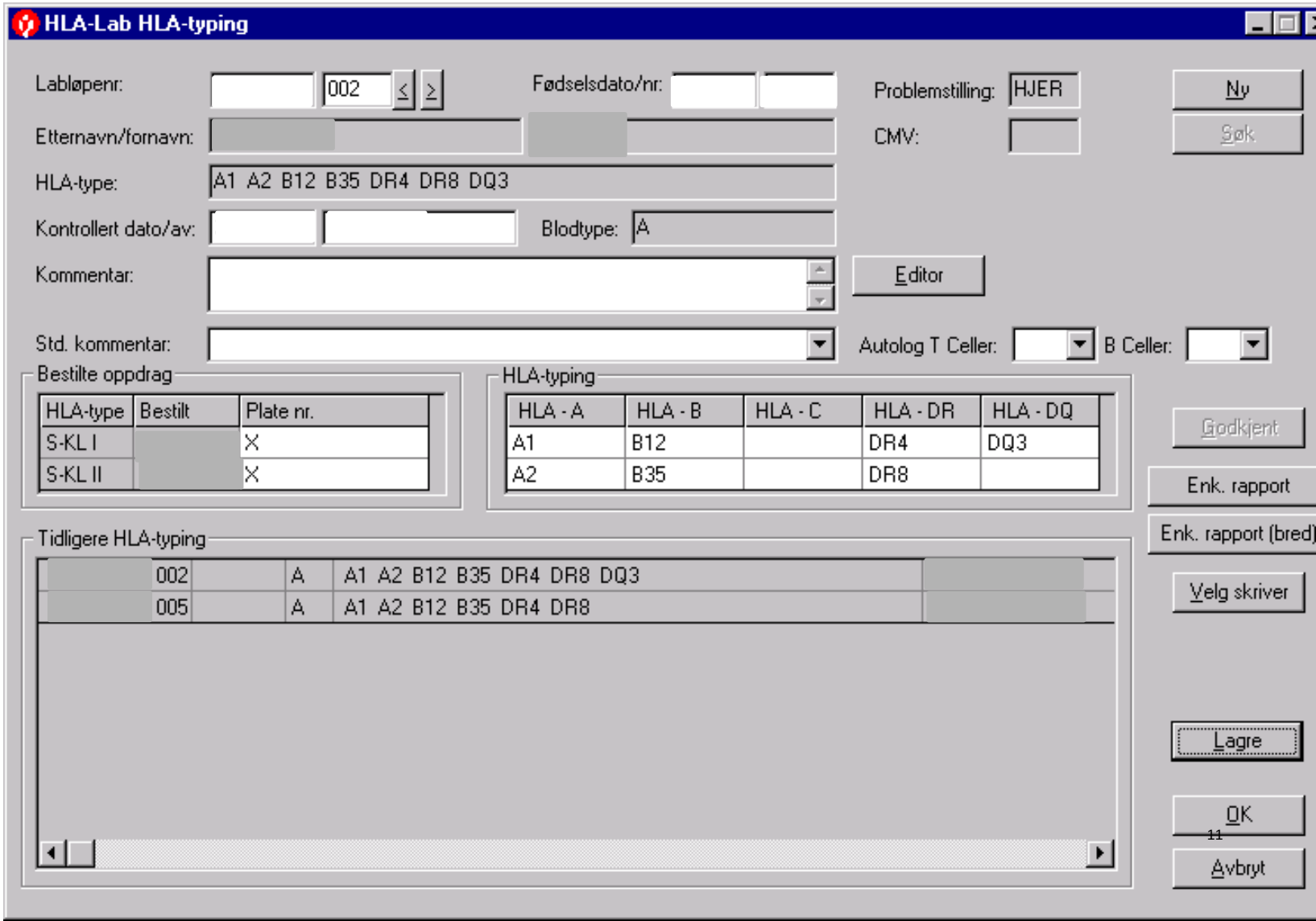
Paper printout of the WL from Nyrebase/HLA Lab

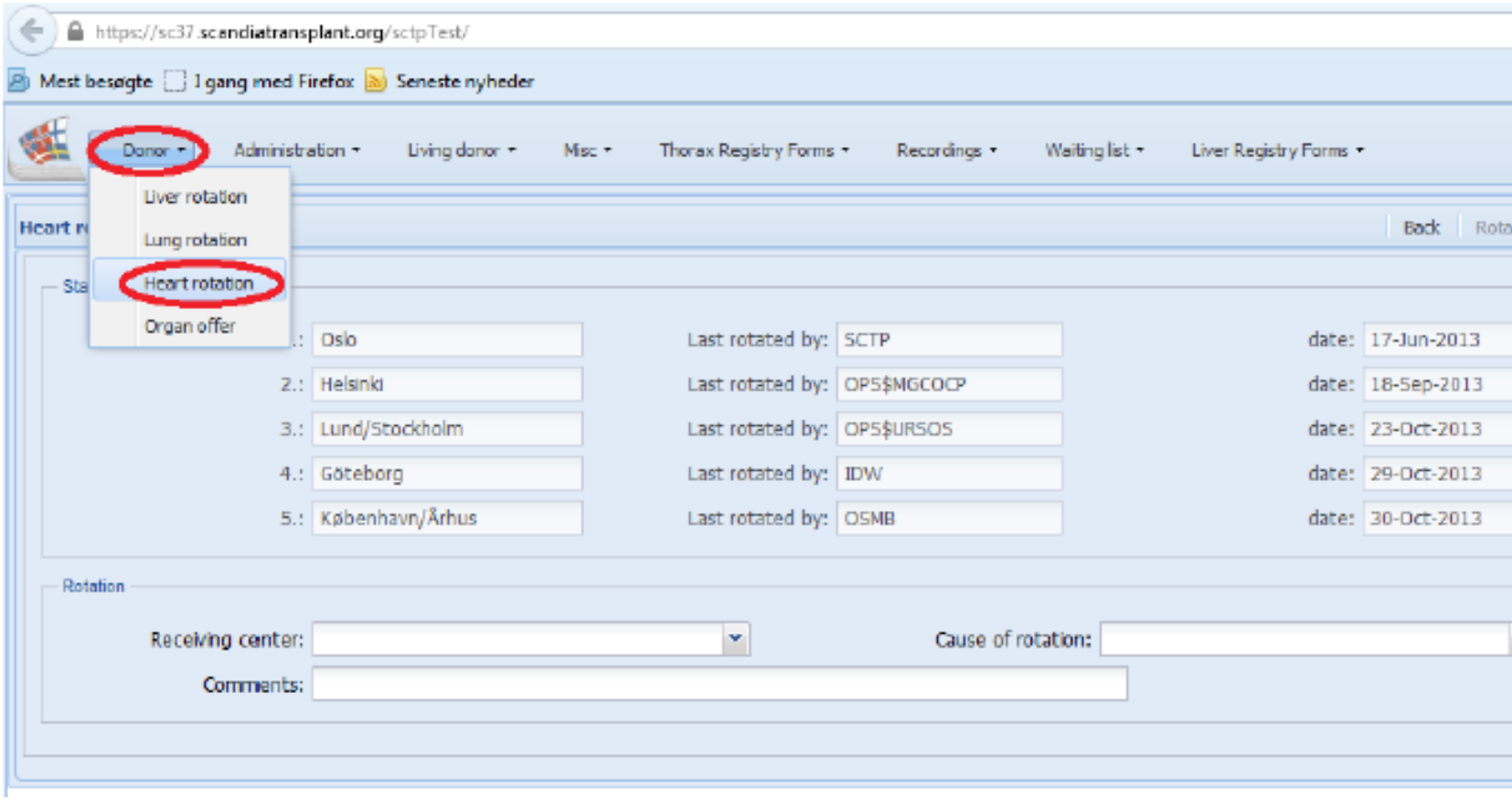


Data on the waiting list:

- 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,

…..

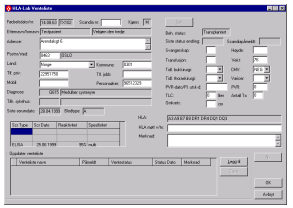

HLA-Lab HLA-typing
Labløpenr:
002
Fødselsdato/nr:
Problemstilling:
HJER
Ny
Etternavn/fornavn:
CMV:
Søk
HLA-type:
A1 A2 B12 B35 DR4 DR8 DQ3
Kontrollert dato/av:
Blodtype:
A
Kommentar:
Editor
Std. kommentar:
Autolog T Celler:
B Celler:
Bestilte oppdrag
HLA-type
Bestilt
Plate nr.
S-KL I
X
S-KL II
X
HLA-typing
HLA - A
HLA - B
HLA - C
HLA - DR
HLA - DQ
A1
B12
DR4
DQ3
A2
B35
DR8
Godkjent
Enk. rapport
Enk. rapport (bred)
Velg skriver
Tidligere HLA-typing
002
A
A1 A2 B12 B35 DR4 DR8 DQ3
005
A
A1 A2 B12 B35 DR4 DR8
Lagre
OK
Avbryt

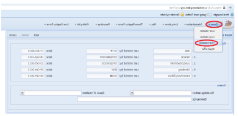

https://sc37.scandiatransplant.org/sctpTest/
Mest besøgte
I gang med Firefox
Seneste nyheder
Donor
Administration
Living donor
Misc
Thorax Registry Forms
Recordings
Waiting list
Liver Registry Forms
Liver rotation
Lung rotation
Heart rotation
Organ offer
Back
1.: Oslo
Last rotated by: SCTP
date: 17-Jun-2013
2.: Helsinki
Last rotated by: OPS$MGCOCP
date: 18-Sep-2013
3.: Lund/Stockholm
Last rotated by: OPS$URSOS
date: 23-Oct-2013
4.: Göteborg
Last rotated by: IDW
date: 29-Oct-2013
5.: København/Århus
Last rotated by: OSMB
date: 30-Oct-2013
Rotation
Receiving center:
Cause of rotation:
Comments:

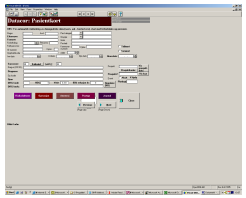
Referral	Evaluation Period	Waiting Period	Transplant Surgery	Post-operative recovery	Follow up

Matching recipient and donor

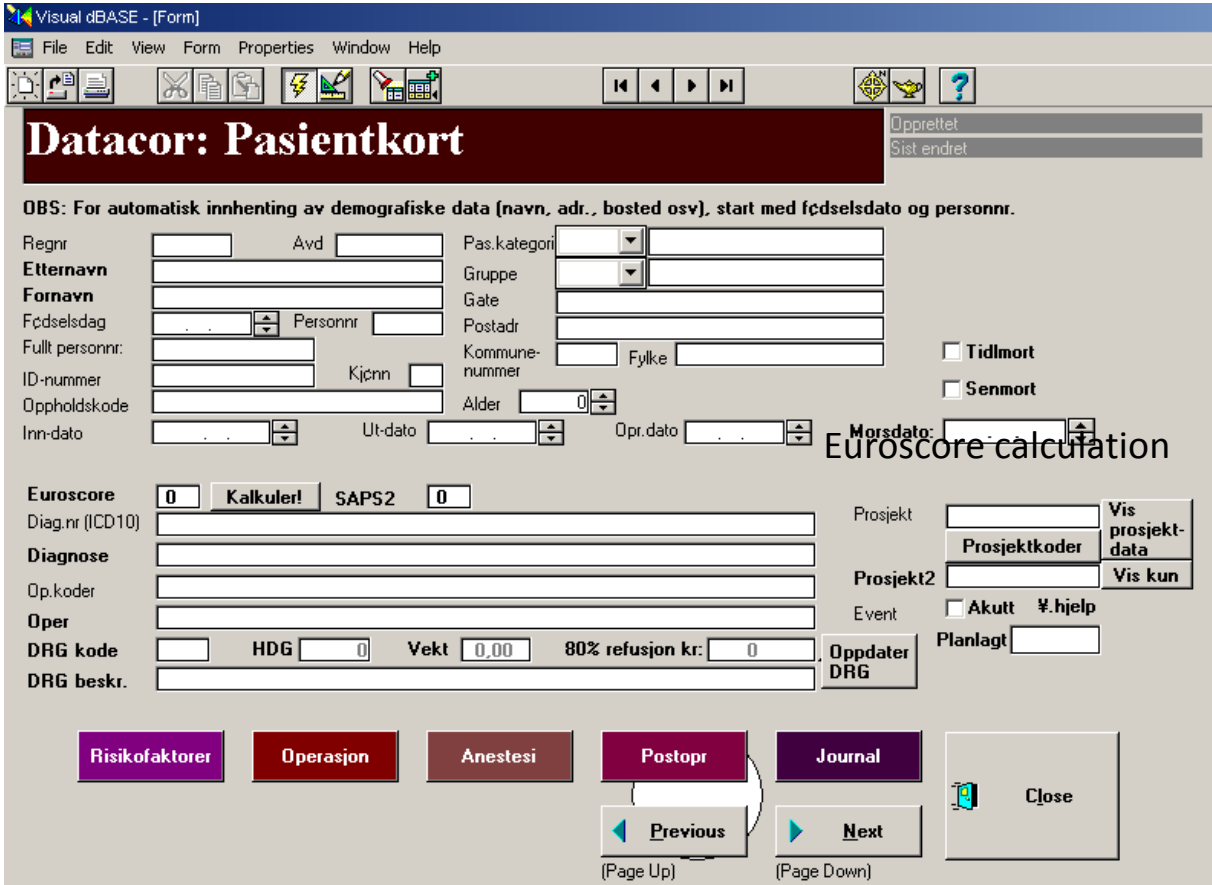
Waiting list



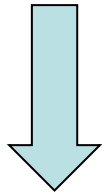




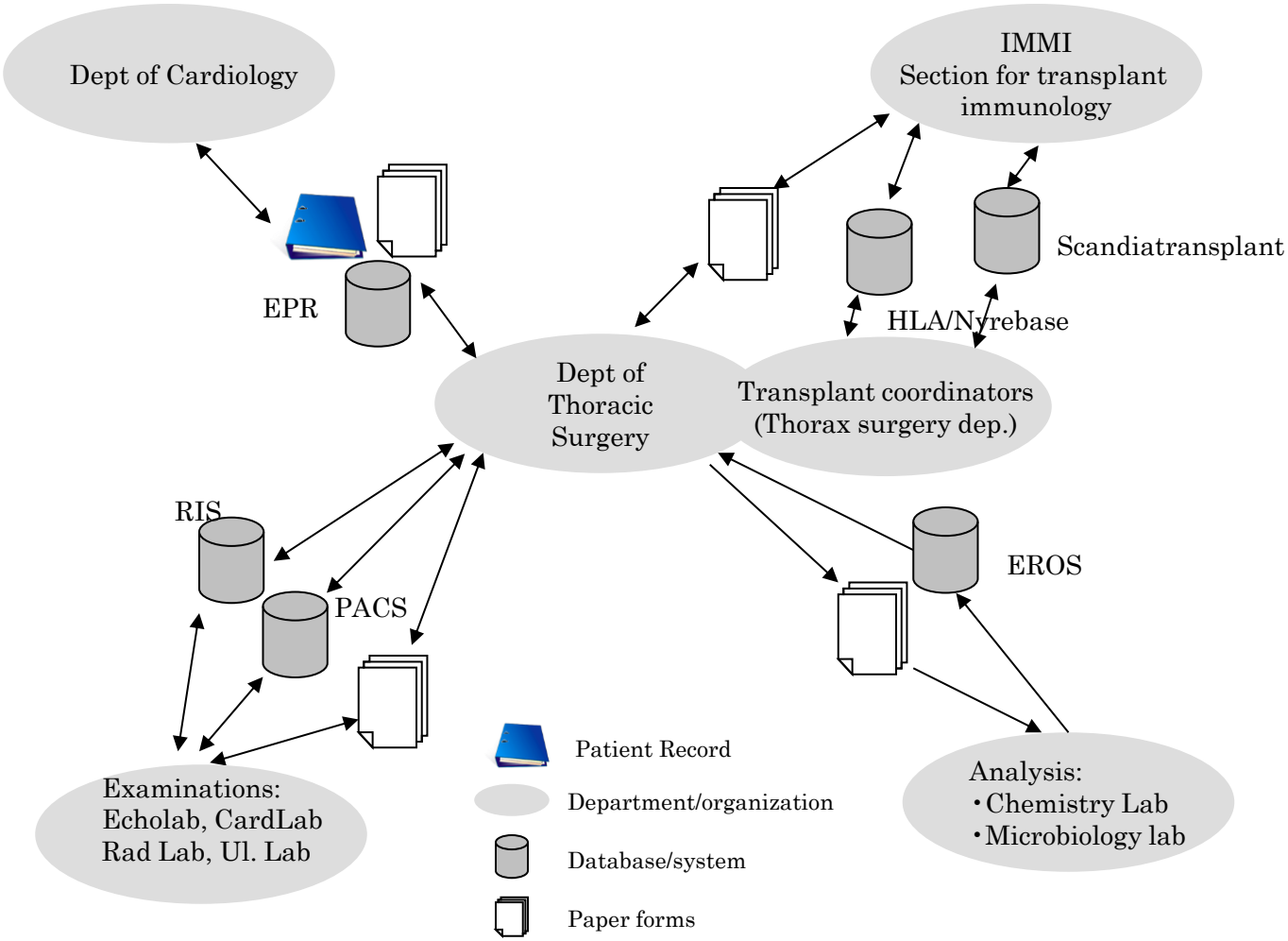
Patient record

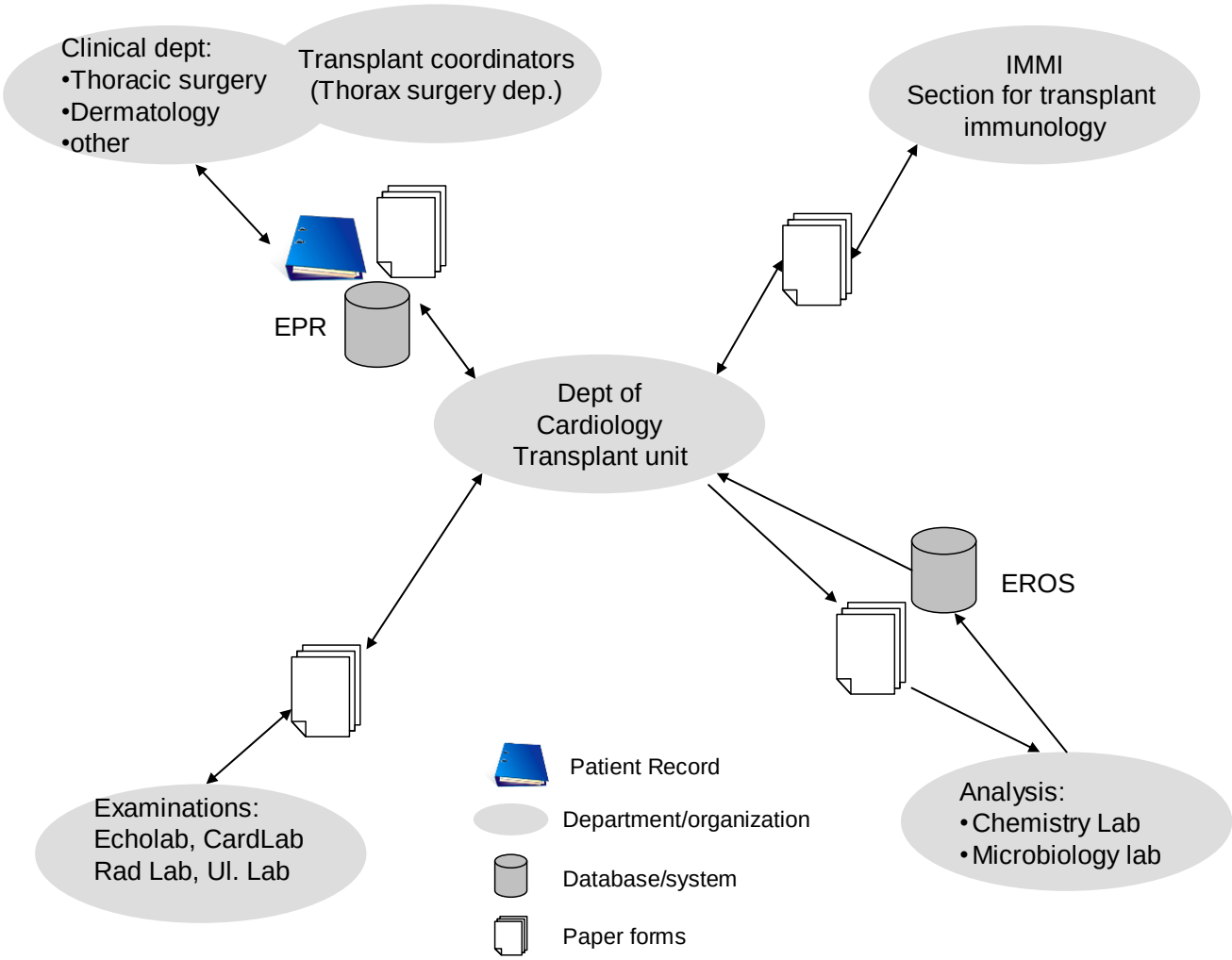

Visual dBASE - [Form]
File Edit View Form Properties Window Help
Datacor: Pasientkort
Opprettet
Sist endret
OBS: For automatisk innhenting av demografiske data (navn, adr., bosted osv), start med fødselsdato og personnr.
Regnr
Avd
Pas.kategori
Etternavn
Gruppe
Fornavn
Gate
Fødselsdag
Personnr
Postadr
Fullt personnr:
Kommune-nummer
Fylke
Tidlmort
ID-nummer
Kjønn
Senmort
Oppholdskode
Alder
Inn-dato
Ut-dato
Opr.dato
Morsdato:
Euroscore calculation
Euroscore
Kalkuler!
SAPS2
Diag.nr (ICD10)
Diagnose
Op.koder
Oper
DRG kode
HDG
Vekt
80% refusjon kr:
DRG beskr.
Oppdater DRG
Prosjekt
Vis prosjekt-data
Prosjektkoder
Prosjekt2
Vis kun
Event
Akutt
¥.hjelp
Planlagt
Risikofaktorer
Operasjon
Anestesi
Postopr
Journal
Close
Previous
Next
(Page Up)
(Page Down)
Bilde1.wfm

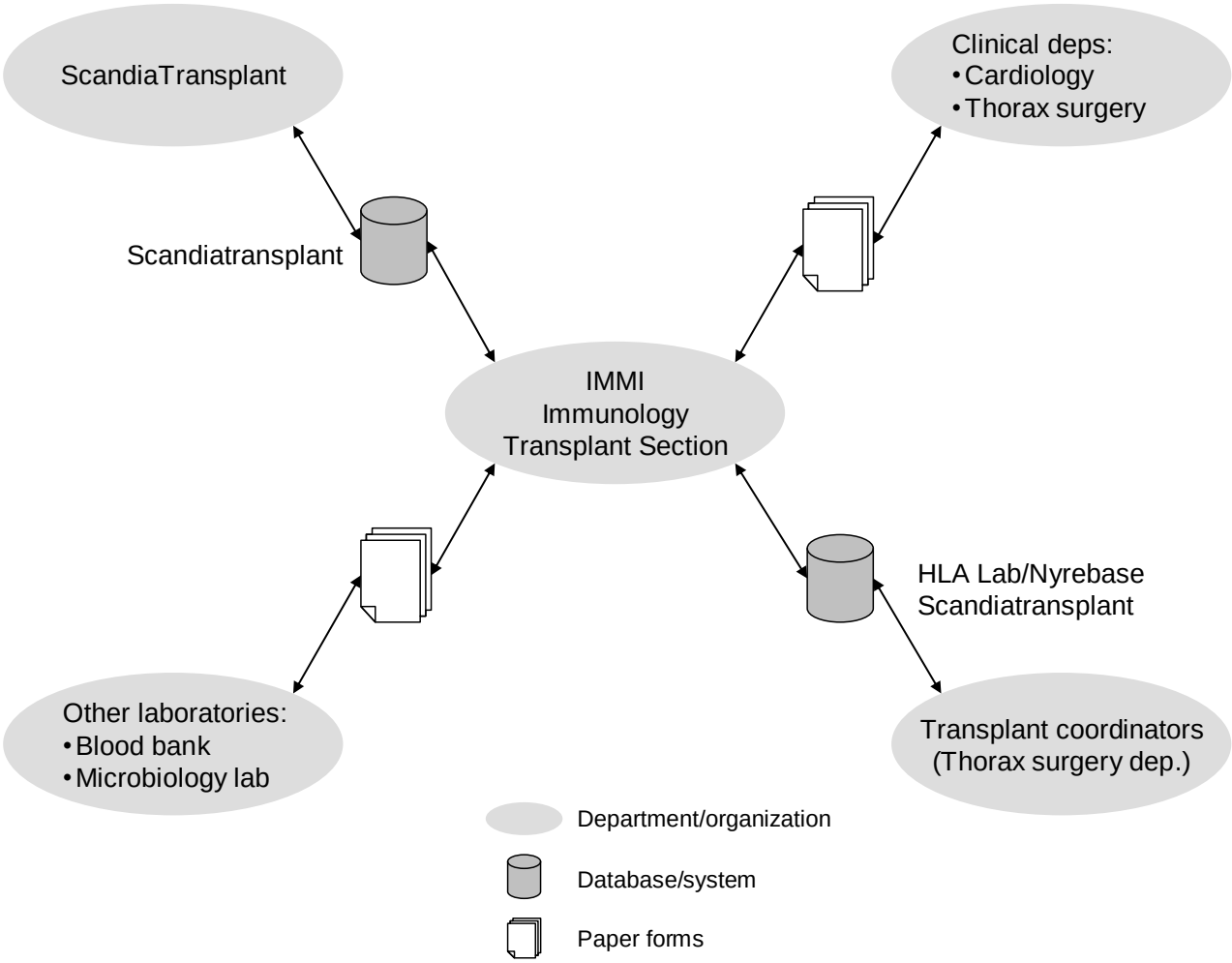
Referral	Evaluation Period	Waiting Period	Transplant Surgery	Post-operative recovery	Follow up

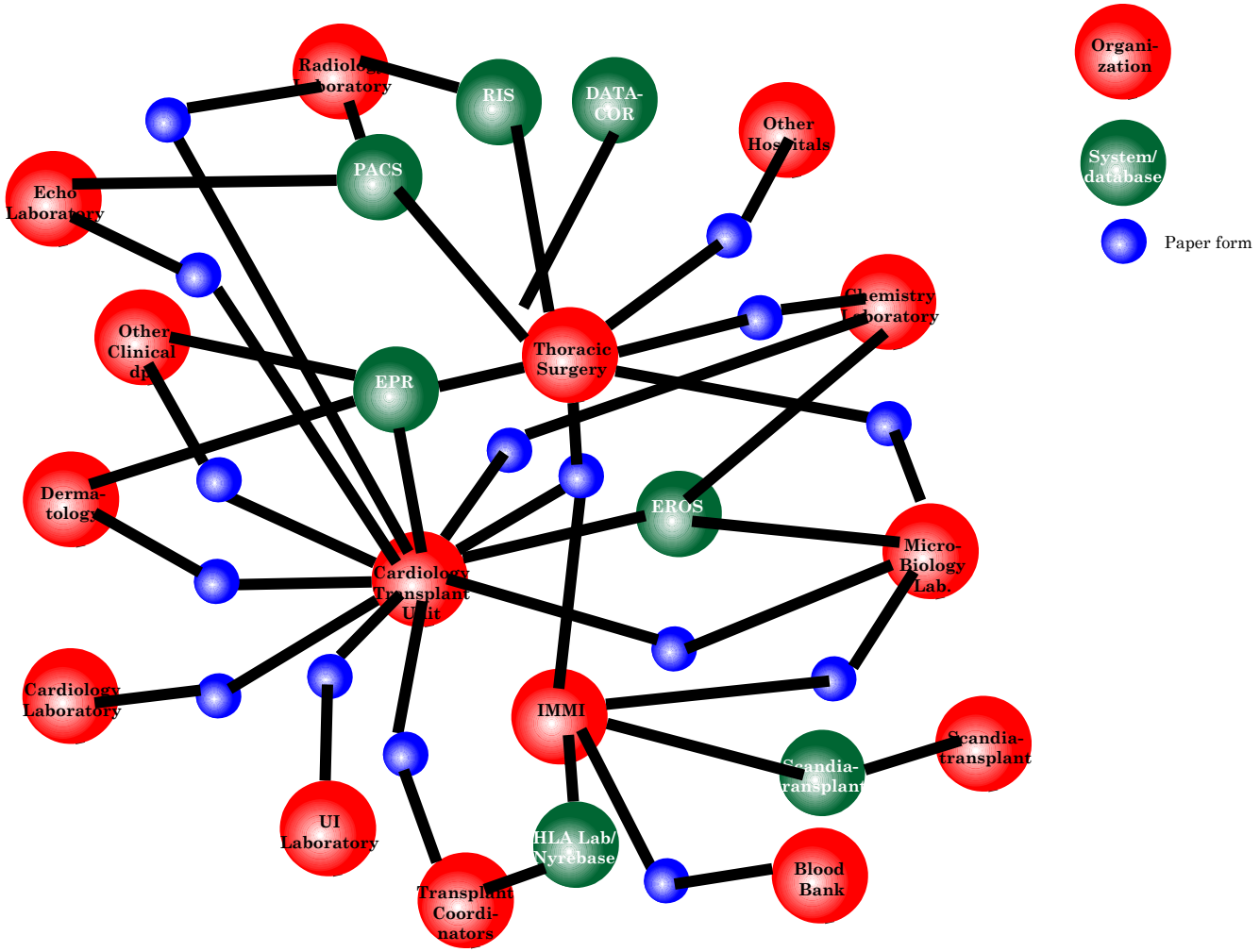


- Patient record
- Electronic Patient Record
- Paper and electronic forms
- with Results from visits


Dept of Cardiology
IMMI
Section for transplant immunology
EPR
Scandiatransplant
HLA/Nyrebase
Dept of Thoracic Surgery
Transplant coordinators (Thorax surgery dep.)
RIS
PACS
EROS
Examinations:
Echolab, CardLab
Rad Lab, Ul. Lab
Analysis:
• Chemistry Lab
• Microbiology lab
Patient Record
Department/organization
Database/system
Paper forms


Clinical dept:
•Thoracic surgery
•Dermatology
•other
Transplant coordinators
(Thorax surgery dep.)
IMMI
Section for transplant
immunology
EPR
Dept of
Cardiology
Transplant unit
EROS
Examinations:
Echolab, CardLab
Rad Lab, Ul. Lab
Analysis:
•Chemistry Lab
•Microbiology lab
Patient Record
Department/organization
Database/system
Paper forms


ScandiaTransplant
Clinical deps:
• Cardiology
• Thorax surgery
Scandiatransplant
IMMI
Immunology
Transplant Section
HLA Lab/Nyrebase
Scandiatransplant
Other laboratories:
• Blood bank
• Microbiology lab
Transplant coordinators
(Thorax surgery dep.)
Department/organization
Database/system
Paper forms


Organi-
zation
System/
database
Paper form
Radiology
Laboratory
RIS
DATA-
COR
Other
Hospitals
PACS
Echo
Laboratory
Other
Clinical
dpt.
Chemistry
Laboratory
Thoracic
Surgery
EPR
Derma-
tology
EROS
Micro-
Biology
Lab.
Cardiology
Transplant
Unit
Cardiology
Laboratory
IMMI
Scandia-
transplant
Scandia-
transplant
UI
Laboratory
HLA Lab/
Nyrebase
Blood
Bank
Transplant
Coordi-
nators

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

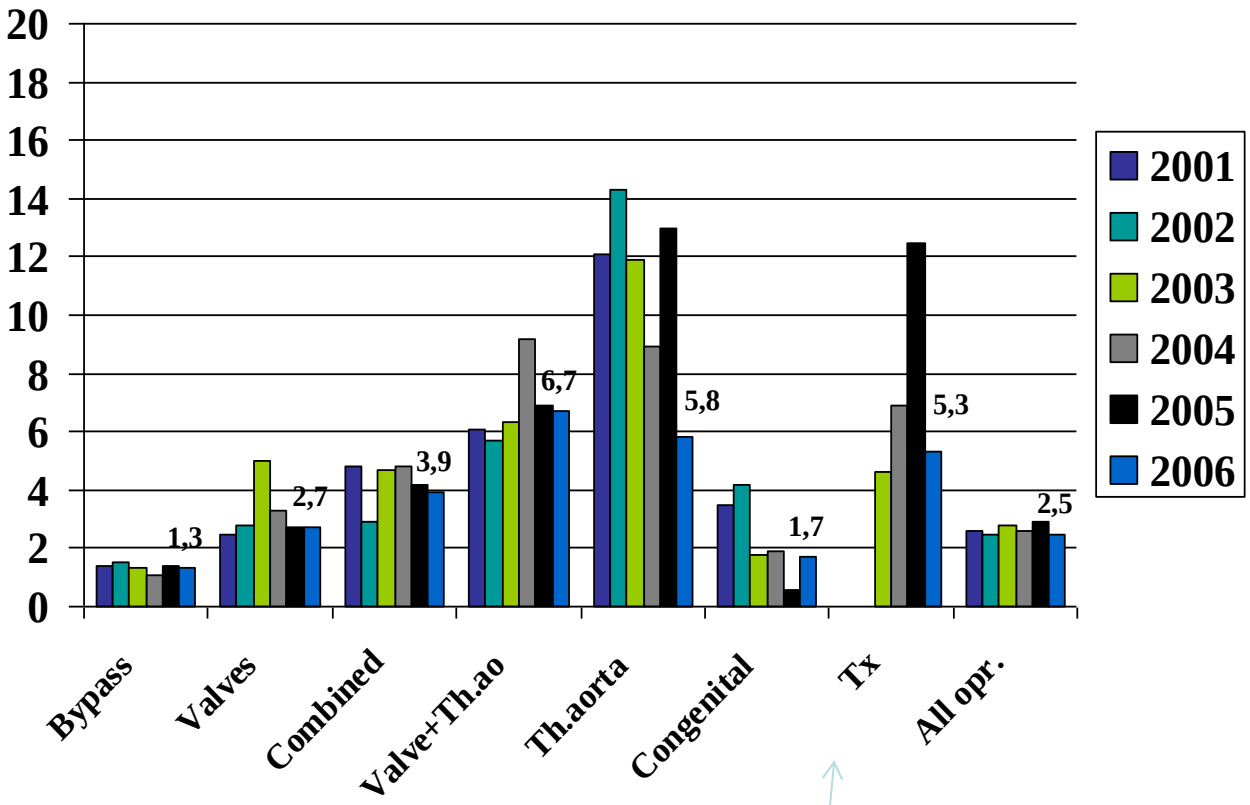
- Medical history of each singular patient
- Chronological order
- What has been done, what results, what are the next steps
- Checklists across shifts, EPR, referral
- Connecting recipient and donor
- Not integrating disciplines and professions

«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
- Quality of the process
- Research oriented
- Located in meetings, conferences, research articles, scientific community
- EPR as source of info, Datacor, personal databases, Scandiatransplant

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.
- 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
- Daily patient list in departments, weekly plans

Event-centered logic

- Heart transplantation as *surgical procedure*
- Specific event
- Minimize uncertainties
- Two directions:
  - Define as much as possible temporal and spatial boundaries of the transplant surgery
  - Rely on flexibility of schedules and plans
- Donation plan, waiting list

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

Rikshospitalet
Thoraxkirurgisk

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 :*

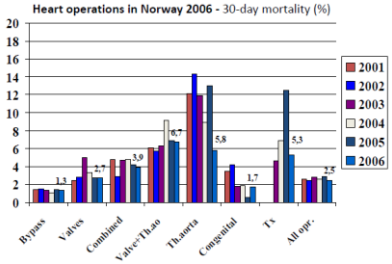
Lokalsykehus		*Pt. innlagt*	
Telefon		*Div*	

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



Transportplan ved innkalling av hjerte-, hjertelunge- og lungereciplienter til transplantasjon

Conclusion

- Many reasons why you work with information in an organization
- Work and the use of information is linked in complex way
- No single logic
  - No sufficient to have a patient trajectory logic, there are many other legitimate needs

- The case shows:
  - ‘socio-technical’ quality of infrastructures
  - ‘shared’ quality of infrastructures
  - And the complexities they generate