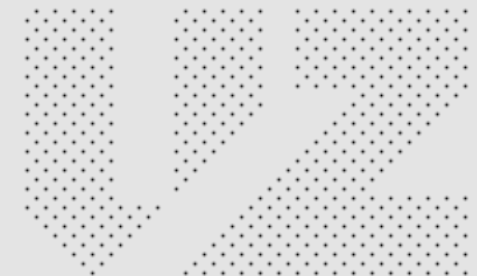


The Leuven hub in the eHealth “hubs & metahub” project

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- *Context - perspective from the hospital / hub.*
- Standards - XDS.
- Emphasis in Leuven project.
- Some challenges & difficulties.

University Hospitals Leuven & the EMR

- **Centrally managed hospital** (central to an unusual degree).
 - **Emphasis on medical cooperation & workflows over departments** (instead of within each department).
 - **Hospital-wide integrated medical record.**
 - Used by all departments.
 - **Emphasis on global workflow & functions common to all departments.**
(e.g., central reporting system adapted to radiology..., 1 central PACS)
 - EMR as a **tool for cooperation** within the medical team (large / dynamic).
 - **Medical management always emphasized that medical record and access to it must not be restricted based on department.**
 - Confirmed by JCI.
 - **Strong filtering with respect to which patient you have access to, however .**

Same emphasis in cooperation beyond the hospital

- Started LISA project in 2000 to give external physicians (GPs,...) access to hospital EMR over the Internet.
 - Can be done for reasonable cost - is more about attitude.
 - Same principle in Mona, Amis, Sara-i,...

PL - KWS-TESTPATIENT NUMMER 14 (14, 460830M999, 62)

Created on	Scheme	Group
15/07/2005	CARBOPLATINUM 5 of 7x(GFR+25) - 4wekelijks (AM...)	Urologische tumoren-Testis
15/07/2005	DTIC 250mg/m ² - CISPLATINUM 30mg/m ² - 3wekelijks ...	Melanomen
15/07/2005	XELODA 625 mg/m ² bid - 3wekelijks (V. 13)	Borsttumoren-Adjuvant
11/08/2005	inductie RT + CT bij SDca F: 800mg/m ² P: 80mg/m ² IV ...	Digestieve tumoren
22/08/2005	TAXOTERE mono 100 mg/m ² - 3wekelijks (V. 22)	
22/08/2005	CHOP long V: 1.4mg/m ² E: 750mg/m ² A: 50mg/m ²	
22/08/2005	CHOP Standard E: 750mg/m ² V: 1.4mg/m ² A: 50mg/m ²	
22/08/2005	DALINO-ARA-C Cytosar 200mg/m ² Cerubidine 4: z CARBO mono 5x(GFR+25) - 4wekelijks (GNC)	
22/08/2005	XELODA 1250 mg/m ² bid - 3wekelijks (V. 13)	

PL - KWS-TESTPATIENT NUMMER 40 (40, 590004M999, 47)

hospitalisatie (12-03-2003 07:49) consultatie (12-03-2003 07:49)

hospitalisatie ABD (7029804) E0 12-03-2003 07:49

Recepten
+ Eindhoven
+ Nieuw v
+ Geen ei
+ Bijlage v
+ Nota toe

Beelden
+ Docume
+ Dictee
+ WWO to
+ Aaldbor
+ Material
+ Peridiat
+ Validee

test	referentie	19-03-2007	19-03-2007
Bez sneehed	1 - 15		nat genooj
Hemoglobine	120 - 160		
Hb (BGA)	120 - 160		
Hematoocriet	0.370 - 0.470		0.480
RBC telling	3.90 - 5.80		
WBC telling	4.00 - 10.00		
Neut-autom.	38.0 - 77.0		
Eosn-autom.	≤ 6.0		
Baso-autom.	≤ 1.0		
Lymf-autom.	20.0 - 50.0		
Mono-autom.	2.0 - 10.0		
Aantal WBC			
Normobi-man	≤ 0		
Blaster-man	≤ 0		
Promy-man	≤ 0		
Mylo-man	≤ 0		
Metany-man	≤ 0		
N Slaver-man	≤ 5		
N Segn-man	35 - 77		
Neut-man	38 - 77		
Eosno-man	≤ 5		
Baso-man	≤ 1		

TEST1

Hematoocriet

10-dec-2006 30-dec-2006 14-jan-2007

12-03-2003 BMC algemeen 12-03-2003 BMC

12-03-2003 BMC algemeen 12-03-2003 BMC

6 Remo

P62

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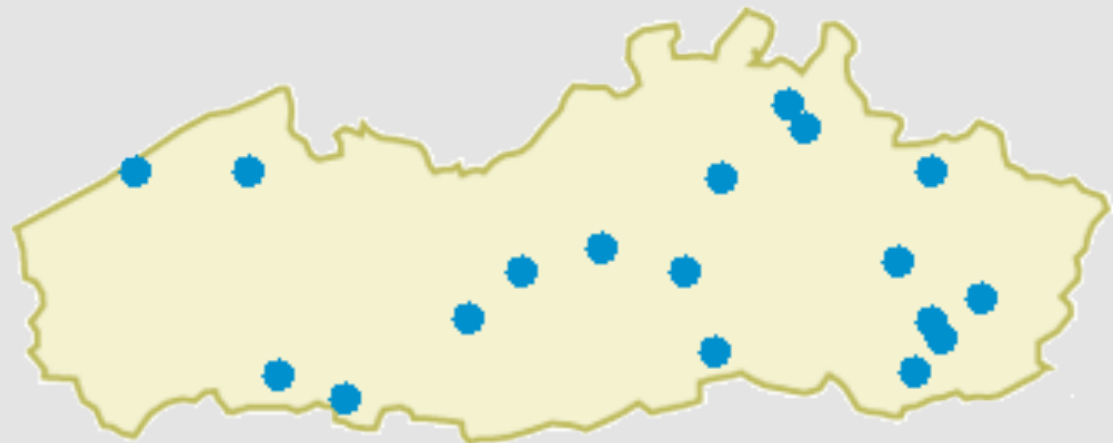
“Flow” projects → RSW,...

- **Efforts for common framework over many hospitals.**
 - Influential contributions by a.o. André Vandenberghe.
 - Critical mass in Réseau Santé Wallon.
 - Template for current hub project.
- **Different starting points & emphasis:**
 - LISA primarily intended as tool to facilitate cooperation between external physician & team within hospital, *for current episode*.
Hub more as longitudinal record.
 - LISA exposes this hospital’s organization → cooperation with 1 hospital.
Hub as an instrument over many hospitals.
 - View on medical *process* - dynamic info, e.g. planned exams & reason for those.
Hub primarily for static information.
 - LISA,...: no need to wait for consensus - rapidly had effect on care.
Hub approach requires standardization - takes quite some time.

Momentum may be sufficient now.

Participation in “hubs & metahub” project

- **System with 2 levels:**
 - A number of hospitals,... establish a regional “hub” for information access.
 - National “meta-hub” only stores which hubs have data & manages consent.
- **Leuven hub = hub of “Vlaams Ziekenhuisnetwerk K.U. Leuven”:**
 - Not restricted to members.
 - VznkuL is not a regional network but a network for sharing know-how, working together around quality,...



This is only the northern part of Belgium

- Context.
- *Standards - XDS.*
- Emphasis in Leuven project.
- Some challenges & difficulties.

The wonderful thing about standards is that there are so many to choose from (attributed to Grace Hopper)

- **Hub predecessor projects are based on Belgian Kmehr standard.**
 - **To ignore already attained achievements would delay social impact.**
 - **Communication in eHealth project is based on Kmehr.**
 - **Completely for the content of messages.**
 - **Web services are similar to those used within RSW.**
- **Leuven hub:**
 - **No legacy project.**
 - **Because of 2 levels, some freedom within the hub.**
 - **Preferred to directly go to international standard (XDS and related standards by IHE).**

Choice is trade-off between short term & long term

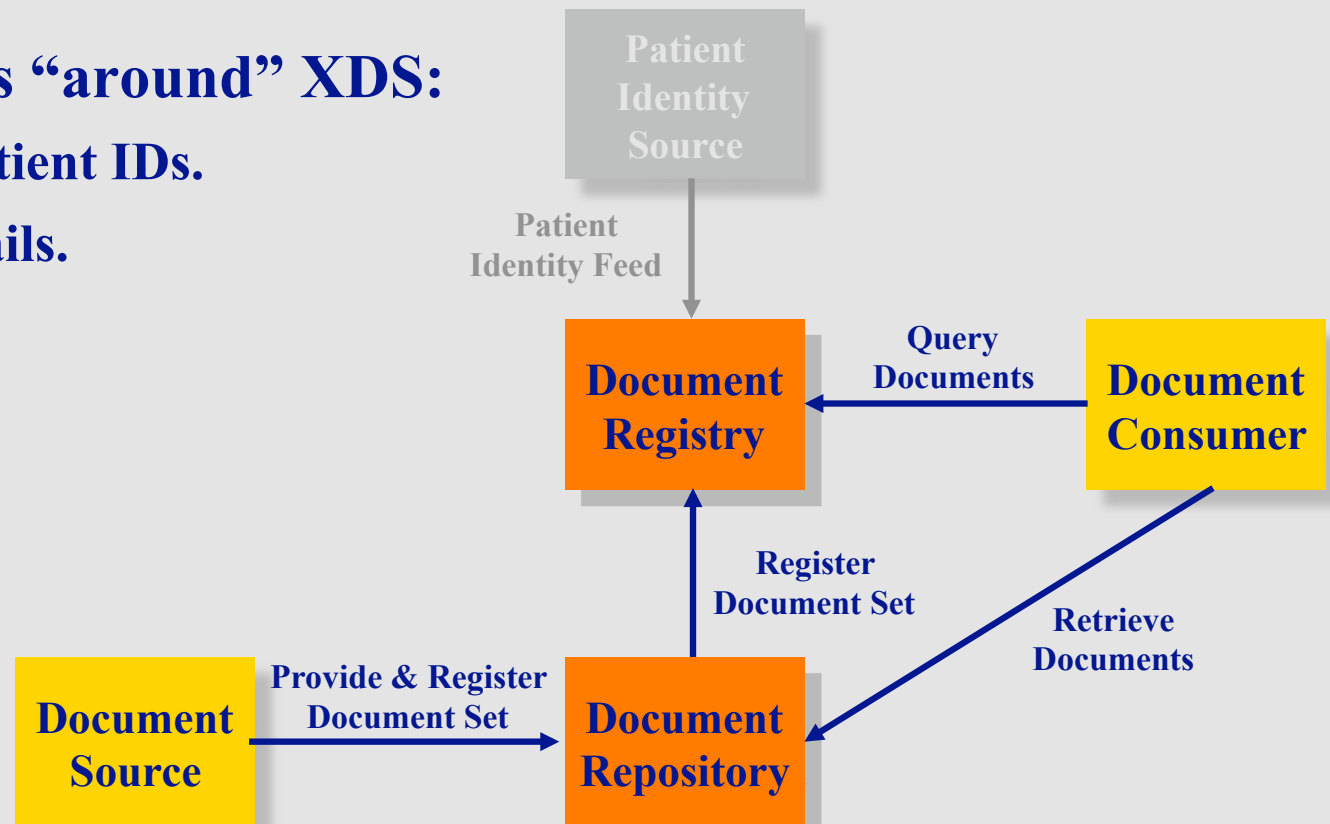
- **Requires efforts to fit into Belgian situation.**
- **Expected advantages on longer term:**
 - **Exploiting world wide know-how and ideas.**
 - **Faster growing tool set, since IHE rapidly develops new functions.**
 - **Availability of commercial products (in *international* competition).**
 - **Avoiding vendor lock-in.**

Integrating the Healthcare Enterprise (IHE)

- **Cooperation between healthcare user organizations and industry aimed at defining standard interoperability solutions.**
- **Defines specific processes / workflows in healthcare that most urgently need to be supported.**
- **Does not create new standards, but selects standards for parts of the process (probably simplifying them and leaving less options).**
- **Does not need to be extremely general or too politically correct:**
 - **Rapid development.**
 - **Early tests in international “connectathons” with many vendors.**
 - **Increasing success.**

XDS (Cross-Enterprise Document Sharing)

- Register links to documents into central registry, allowing others to find out what is available & to fetch documents.
- This is exactly the concept of a hub.
- Additional standards “around” XDS:
 - PIX to translate patient IDs.
 - ATNA for audit trails.
 - ...



- Context.
- Standards - XDS.
- *Emphasis in Leuven project.*
- Some challenges & difficulties.

- **Starting points / assumptions:**

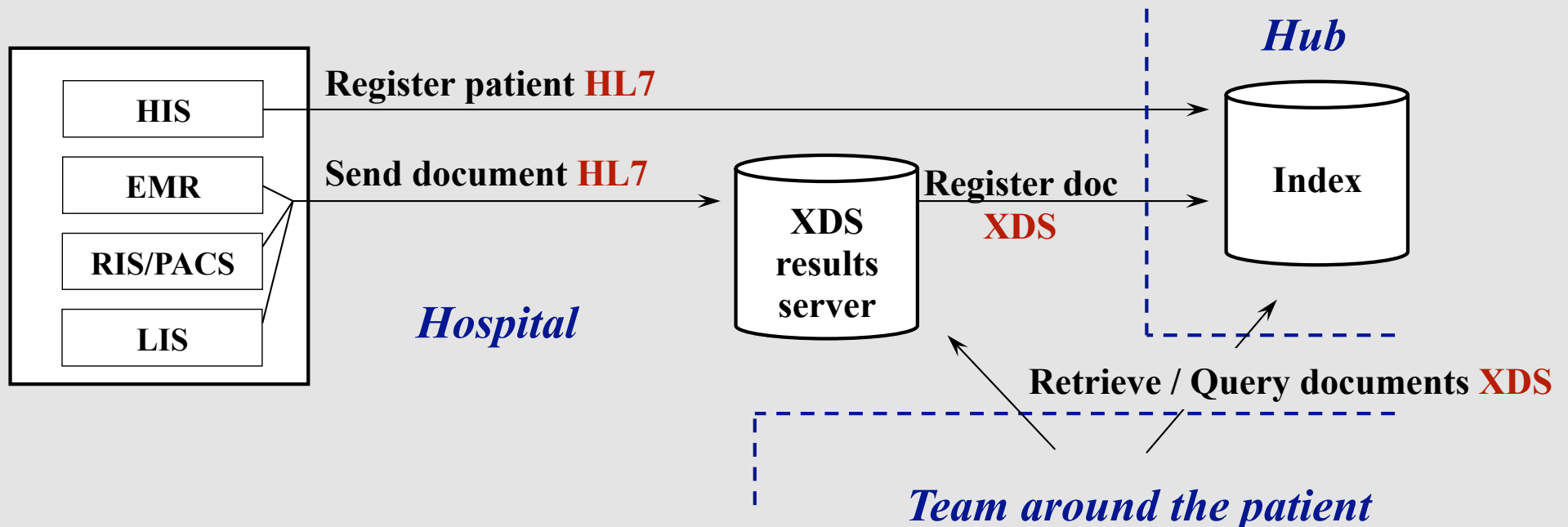
- **Integration efforts within each hospital are the biggest hurdle.**
- **Focus on the medical team more than on individual physician (see 1st slide).**
- **Team changes continuously, and only they can decide what info is relevant.**
- **Trust between the partners in the hub.**
 - **This hub need not be an external organization.**
 - **Legal means to define responsibility where needed, not only technical means.**

→ **Aim:**

- **Limit integration efforts by each partner / concentrate efforts in the hub.**
- **Make a lot of data available - automatically.**

In practice: HL7 feeds

- Belgian medical IT systems do not yet support XDS (except maybe for PACS).
- Typical way to connect is through “XDS enabled results server”:
 - Commercial products available.
 - Thus, from perspective of hospital: HL7 (or DICOM) feeds.
 - And that is business as usual.



Support for patient ID translation

- **Global ID needed for exchange in eHealth.**
- **Hospitals can communicate with hub using local ID.**
 - **Particularly important for PACS,... - to not modify Dicom communication.**
- **IHE PIX profile (master patient index functionality).**

Minimize exceptions in local information flows

- **Reality:**
 - Global patient ID may not be known from beginning.
 - ID may be incorrect, or patients needs to be merged.
 - Registration of documents is subject to patient consent,...
 - **Potential consequences for hospital in naive approach:**
 - Filter messages depending on availability of global ID, consent.
 - Systems needed to transmit backlog once condition fulfilled.
 - Global as well as local corrections / merges - tricky.
 - *Conflicts with both of our goals: minimize efforts & share a lot of data.*
- **Enable hospital to already register all documents anyhow.**
- Even with missing global ID - docs will become available once ID is known.
 - Independent from patient consent (see later).

- Context.
- Standards - XDS.
- Emphasis in Leuven project.
- *Some challenges & difficulties.*

Cooperation with other hubs: XDS meets KMEHR

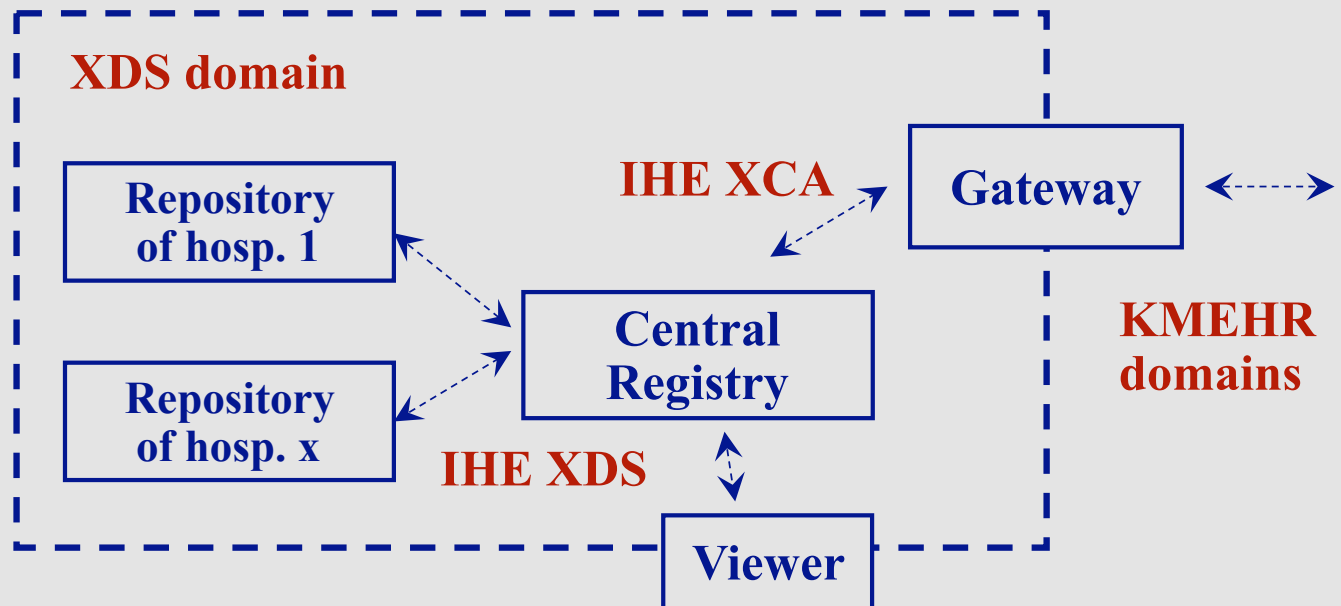
How to achieve this without defeating purpose of using int. standard.

1. KMEHR used as an additional native format.

- XDS is neutral about the document format.
- Style sheets... in commercial viewer + cooperation with that company.

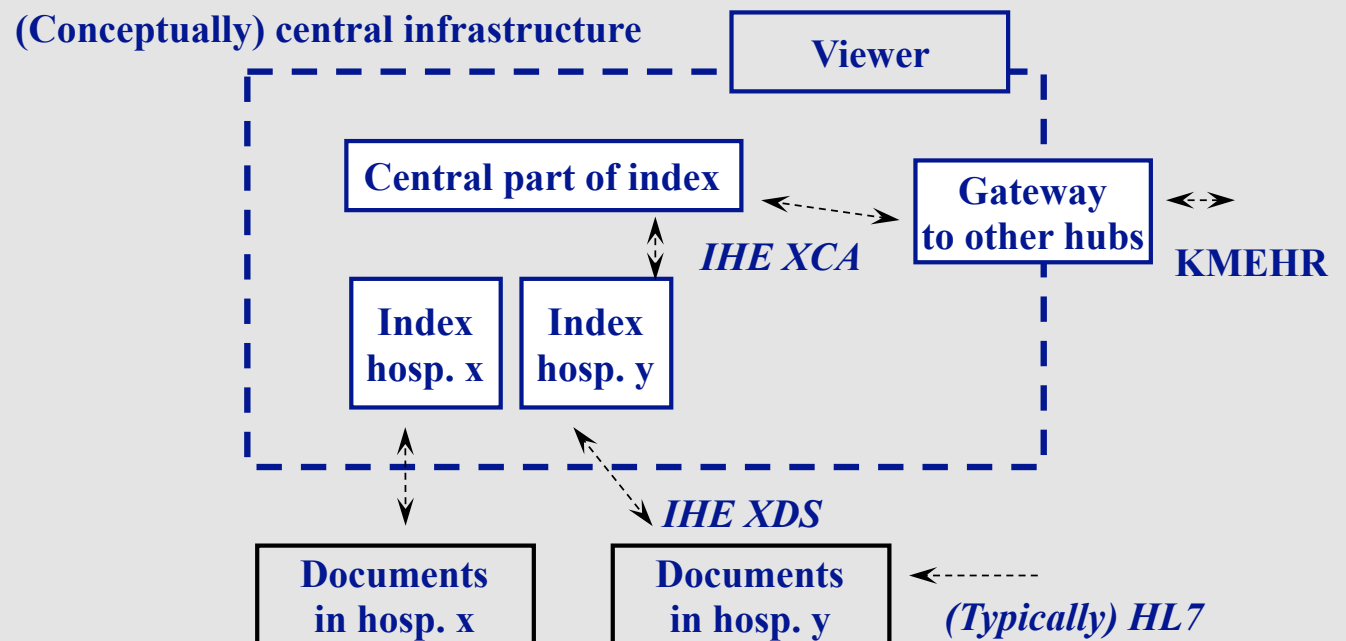
2. IHE XCA standard available to link domains.

- Links to documents are queried from other domain when needed.
- We will try to concentrate all conversion in XCA gateway.
- **Should enable us to stick rigorously to IHE within our domain.**



Patient consent & bootstrapping the project

- Hubs are not allowed to store index data without informed consent.
- Consent may be provided during visit to hospital.
 - But at that moment there are no references in the hub !
 - System with explicit requests for publication = complex, slow.
- XDS index divided in domains that can be physically distributed.
 - Metahub - hubs principle at smaller scale.
 - XCA standard of previous slide facilitates exactly that organization.



Acquiring and registering informed consent

- **Balance between quality of care & privacy.**
- **If explicit opt-in is required:**
 - Additional form to explain and have patient sign.
 - Huge administrative overhead.
 - Adaptations required to *all* information systems.
 - ...
- **Hopefully the best balance will be considered an opt-out system.**

Registering therapeutic relations

- **Basic principles on how to prove therapeutic relation have been established.**
- **But must still be implemented in the field.**
- **(Assumption remains: IT integration efforts in each hospital are the biggest hurdle, not the central developments within the hub.)**

Balance between individualistic & team approach

- **Patient will be allowed to exclude physicians from access.**
- **Suppose that 1 physician in the hospital can be excluded:**
 - **Can all our EMRs ensure that that specific physician gets no access?**
 - **Amount of information available becomes a matter of probability.**
 - **Take exclusion into account in our planning & in assigning physicians to teams = unrealistic.**
 - **Conflicts with our view of medical cooperation and medical quality, but makes perfect sense from a more individualistic view, thus there is no obviously right solution.**
- **In practice, the patient will not go to department in the hospital in which a physician works whom he or she excluded.**
 - **But establishing rules that cannot be enforced also conflicts with our view.**

Cooperation with GPs

- **RSW: organization of (all) hospitals as well as GPs.**
- **Flanders: separate initiatives (even hubs) by 1st line?**
- **From perspective of our hub:**
 - **For each of the hospitals, cooperation with GPs is definitely important.**
 - **Hub often regarded as (better) alternative to hospital-specific portal.**
 - **Authentication will be possible using the eHealth system.**
 - **Authorization may not be straightforward, though.**
 - **But we have still a lot of work in listening to / learning from these partners.**