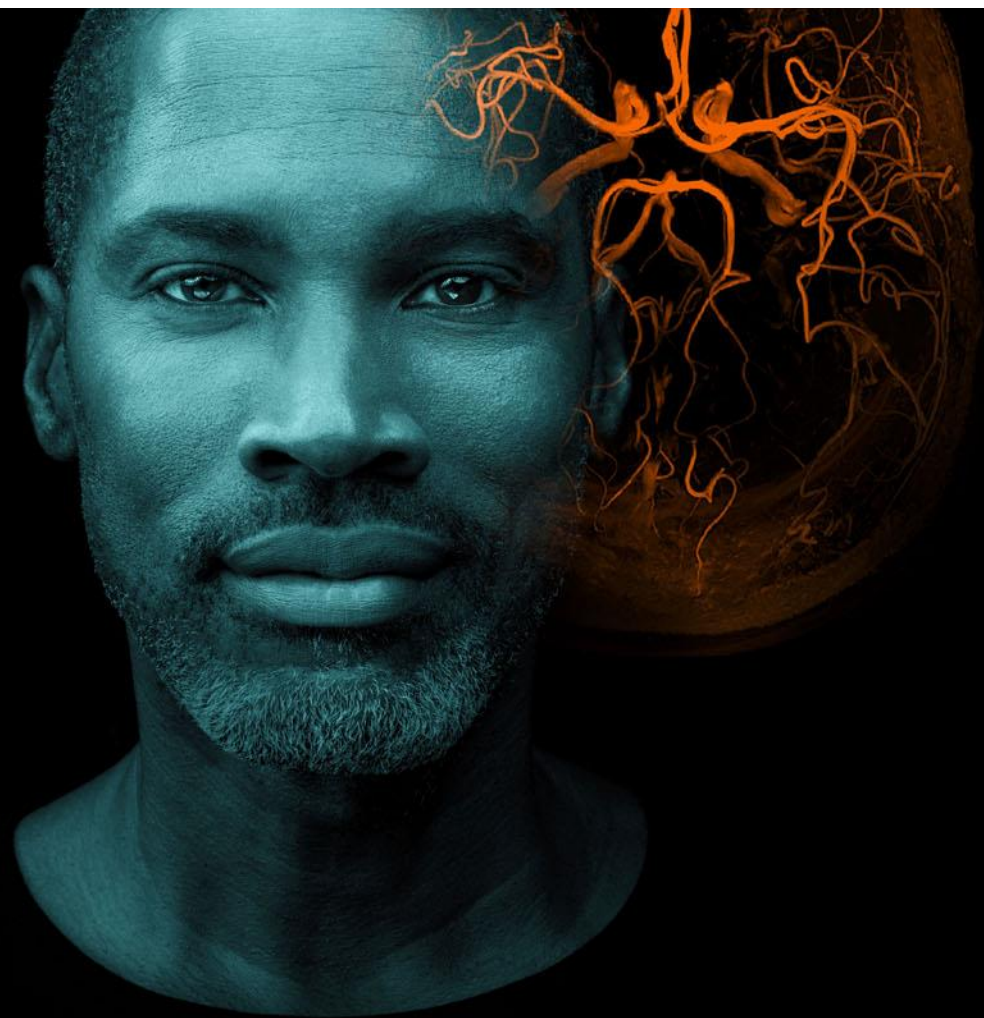
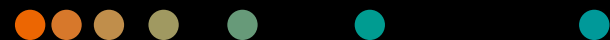


Data- og dokumentdeling

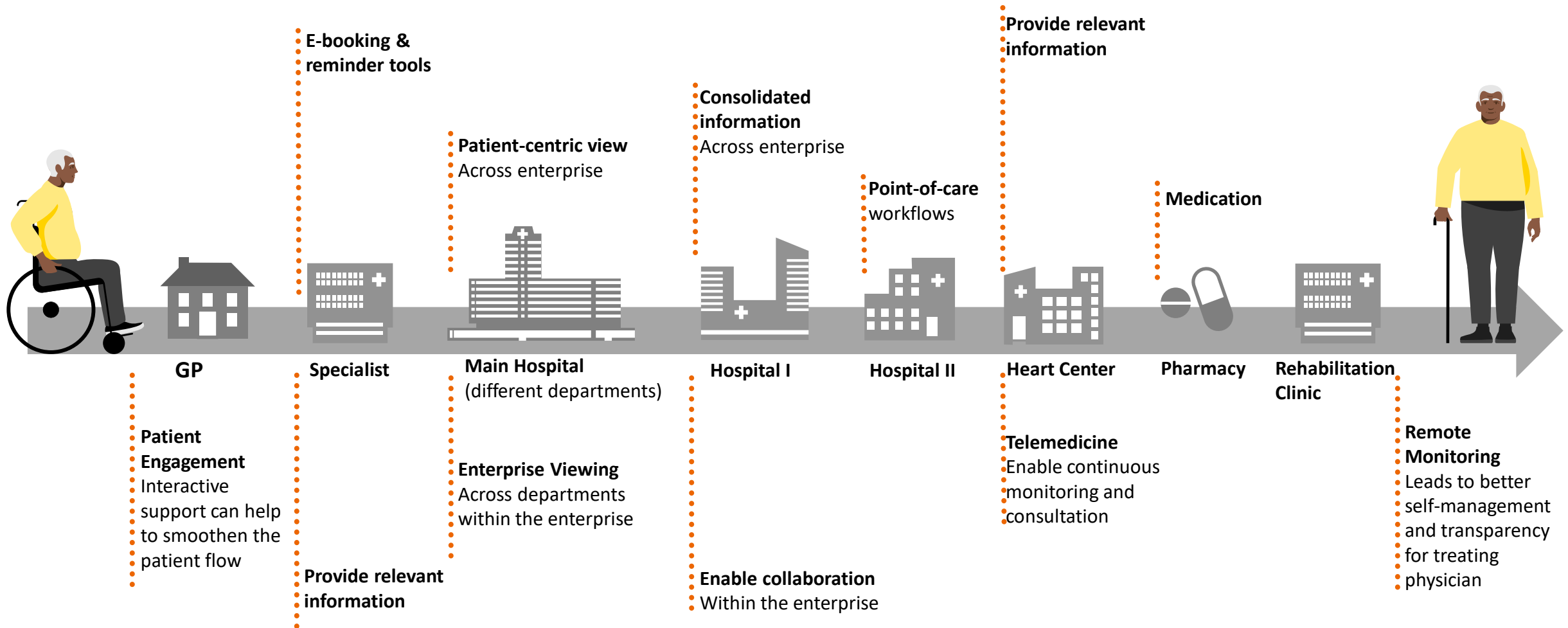
FHIR Fagforum

Ingvar Sørlien
24.5.2023

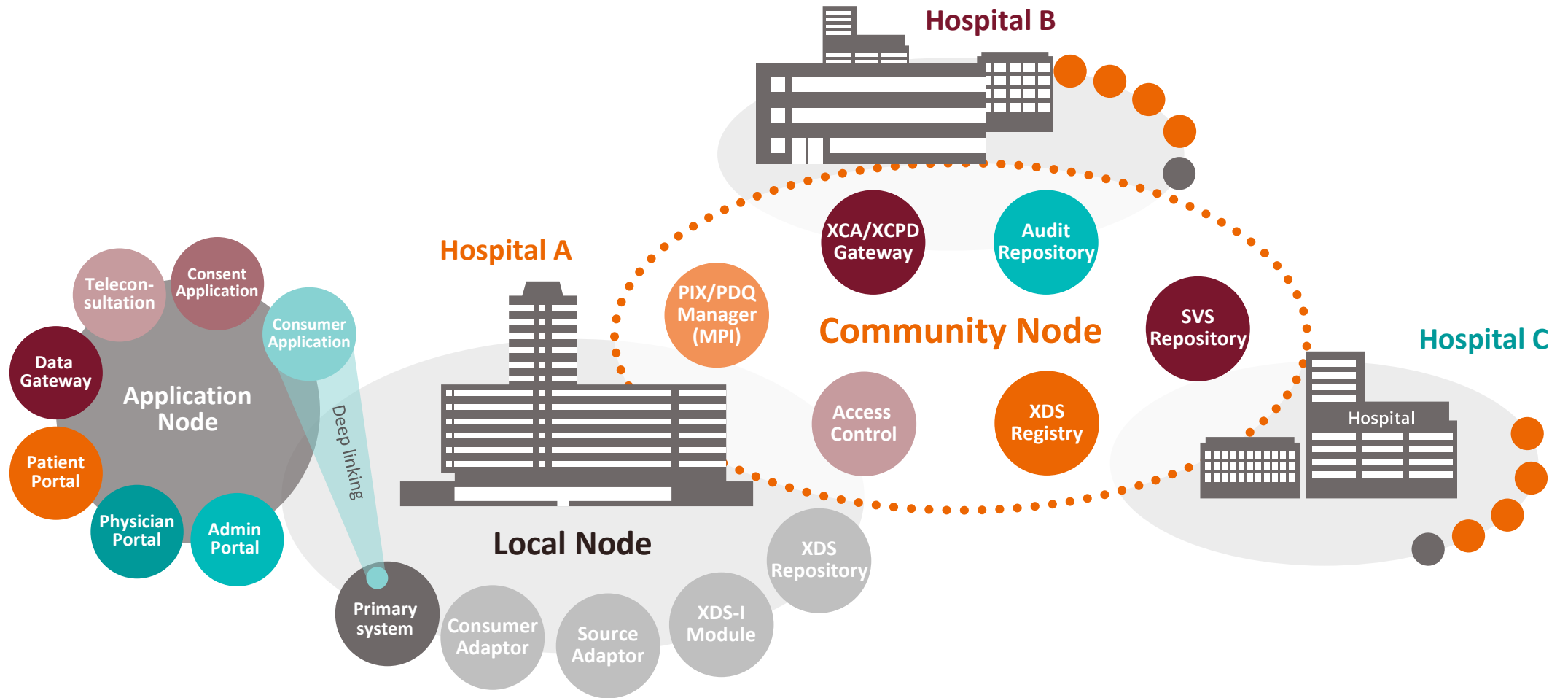


- **Infrastruktur for deling av helseinformasjon**
- **FHIR i dokumentdelingskontekst**
- **FHIR som diskrete data**
- **Tilgangsstyring – dokument og FHIR-kontekst**

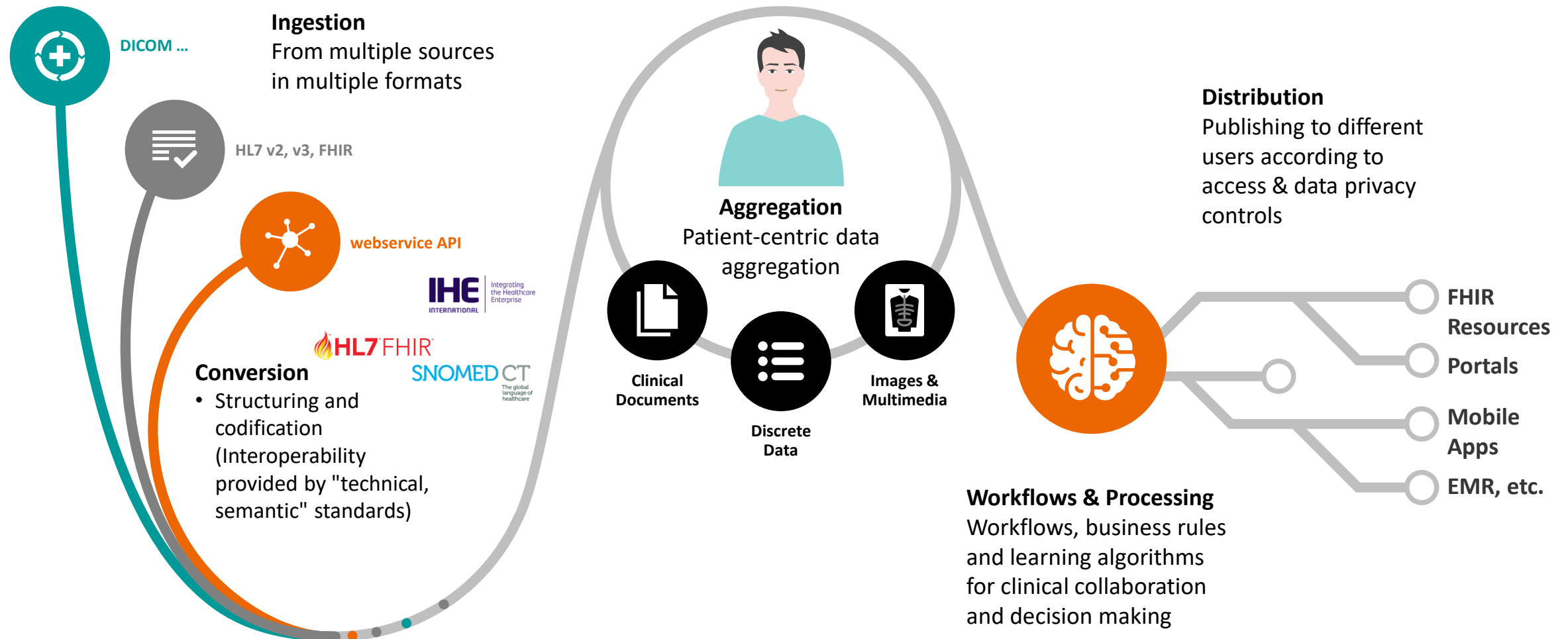
Pasientforløpet



eHealth Solutions – Portfolio Overview



En plattform – ulike grensesnitt



Dokument eller data?

«Dokumenter» er bærere av data

Eks.

- en epikrise er en samling data som er logisk strukturert til et dokument
- Dokumentet inneholder både strukturerte data og fritekst
- Et lab-svar er en samling diskrete målinger

```
<code code="2823-3"  
codeSystem="2.16.840.1.113883.6.1"  
codeSystemName="LOINC" displayName=" Potassium  
molar conc "/>  
<value unit="mmol/L" value="4.96"  
xsi:type="PQ"/>  
<low value="3.5" unit="mmol/L"/>  
<high value="5.0" unit=" mmol/L "/>
```

Dokument ≠



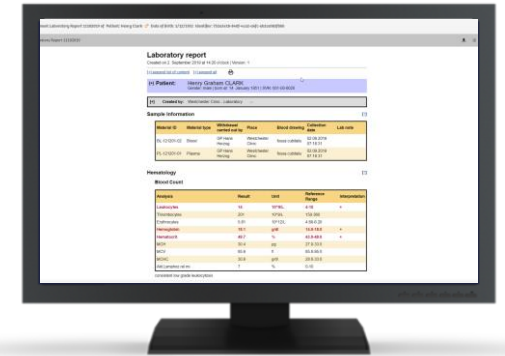
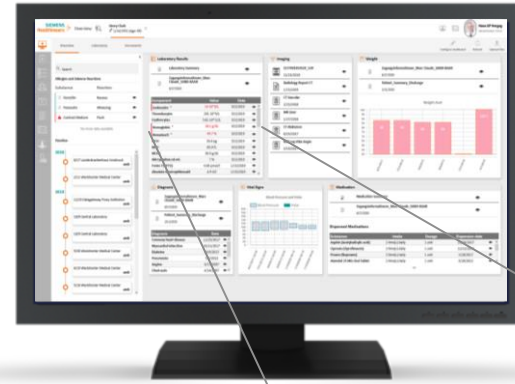
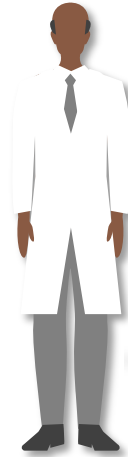
Dokument =



Dokument =



Strukturerte dokumenter – et eksempel



Thrombocytes	202 10 ⁹ /L	9/2/2019
Erythrocytes	5.81 10 ¹² /L	9/2/2019
Hemoglobin	18.1 g/dL	9/2/2019
Hematocrit	45.7 %	9/2/2019
MCH	30.4 pg	9/2/2019
MCV	85.9 fL	9/2/2019

1. Ola havner på legevakten på grunn av en liten ulykke.

1. Siri jobber er sykepleier på legevakten hun undersøker Ola og tar bl.a. en prøve av hemoglobin-nivået.

4. Leif er Ola sin fastlege. Når Ola kommer til konsultasjon ser han først på pasientsammendraget. Sammendraget genereres ut fra de strukturerte dataene

6. Leif får opp journalnotatet fra legevakten, som inkluderer målingen han ønsket å se nærmere på.

5. Leif har behov for å se kontekst rundt målingen av hemoglobin, siden den er lav.

3. Infrastrukturen lagrer originaldokumentet OG ekstraherer strukturerte data for gjenbruk/sammenstilling.

```
{
  "resourceType": "Bundle",
  "id": "DH0ReportBundle",
  "type": "document",
  "identifier": {
    "system": "urn:ietf:rfc:3986",
    "value": "urn:uuid:05083c24-9518-40b4-af27-a365b381c4f3"
  },
  "timestamp": "2019-09-27T13:13:00Z",
  "entry": [
    {
      "resource": {
        "resourceType": "Composition",
        "id": "1",
        "meta": {
          "profile": [
            "http://ehelse.no/fhir/StructureDefinition/vkp-Composition-v000"
          ]
        },
        "status": "final",
        "type": {
          "coding": [
            {
              "code": "34133-9",
              "system": "http://loinc.org"
            }
          ]
        }
      }
    }
  ]
}
```

2. Prøve-svaret prosesseres i legevaktens it-systemer og legges inn i journalnotatet. Journalnotatet sendes som et FHIR dokument via MHD til dokumentdelings-infrastrukturen

Overview

Henry Clark
♂ 1/14/1951 (Age: 69) ✕

Hans GP Hergog
Westchester Clinic

Overview

Laboratory

Documents

Search

Allergies and Adverse Reactions

Substance	Reaction
Penicillin	Nausea
Paracodin	Wheezing
▲ Contrast Medium	Flush

No more data available

Timeline

2020

- 8/17 Landeskrankehaus Innsbruck amb
- 2/11 Westchester Medical Center amb

2019

- 12/23 Datagateway Proxy Institution amb
- 10/9 Central Laboratory amb
- 10/9 Central Laboratory amb
- 9/30 Westchester Medical Center amb
- 6/19 Westchester Medical Center amb
- 5/16 Westchester Medical Center amb

Laboratory Results

Laboratory Summary

Zugangsinformationen_Marc Claude_SAND-BAAR
8/17/2020

Component	Value	Date
Leukocytes ▲	14 10 ⁹ /L	9/2/2019
Thrombocytes	201 10 ⁹ /L	9/2/2019
Erythrocytes	5.81 10 ¹² /L	9/2/2019
Hemoglobin ▲	18.1 g/dL	9/2/2019
Hematocrit ▲	49.7 %	9/2/2019
MCH	30.4 pg	9/2/2019
MCV	85.9 fL	9/2/2019
MCHC	30.9 g/dL	9/2/2019
Akt.Lymphoz.rel.mi.	7 %	9/2/2019
Freies T3 (FT3)	4.00 pmol/l	1/15/2019
Absolute Neutrophilenzahl	4.9 G/l	1/15/2019

Diagnosis

Zugangsinformationen_Marc Claude_SAND-BAAR
8/17/2020

Patient_Summary_Discharge
2/11/2020

Diagnosis	Date
Coronary heart disease	11/25/2017
Myocardial infarction	10/21/2017
Diabetes	10/9/2017
Pneumonia	7/3/2013
Angina	4/17/2007
Chest pain	4/14/2007

Imaging

1577091454529_539
12/23/2019

Radiology Report CT
1/15/2019

CT Vascular
2/23/2018

MR Liver
1/27/2018

CT Abdomen
8/25/2017

MRI Leg Vida Angio
4/19/2017

Vital Signs

Blood Pressure and Pulse

Weight

Zugangsinformationen_Marc Claude_SAND-BAAR
8/17/2020

Patient_Summary_Discharge
2/11/2020

Weight chart

Medication

Medication Summary

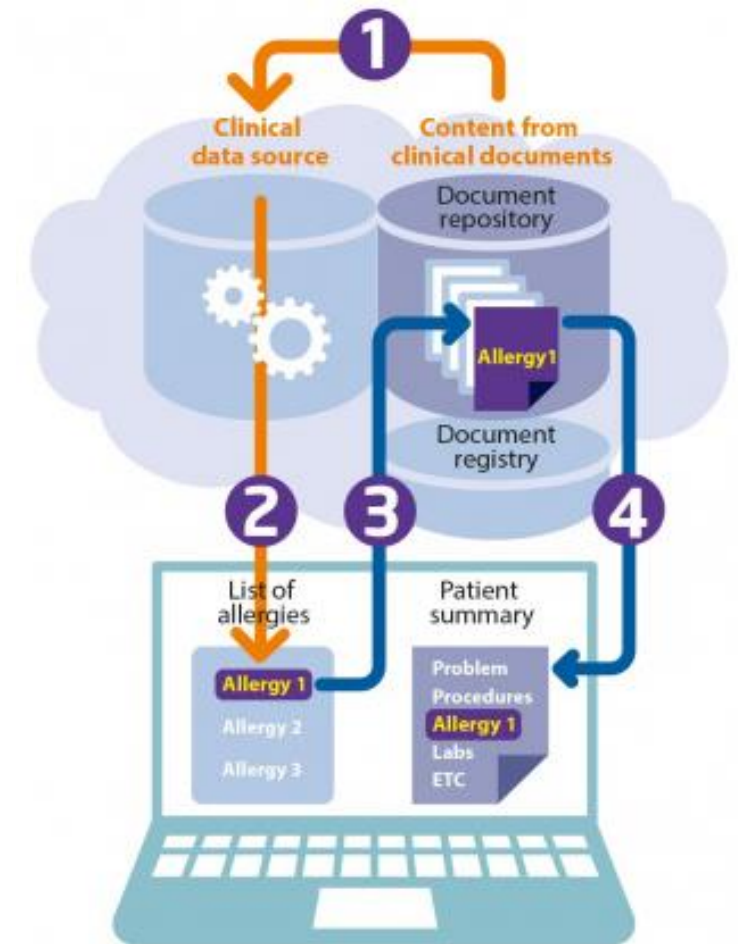
Zugangsinformationen_Marc Claude_SAND-BAAR
8/17/2020

Dispensed Medications

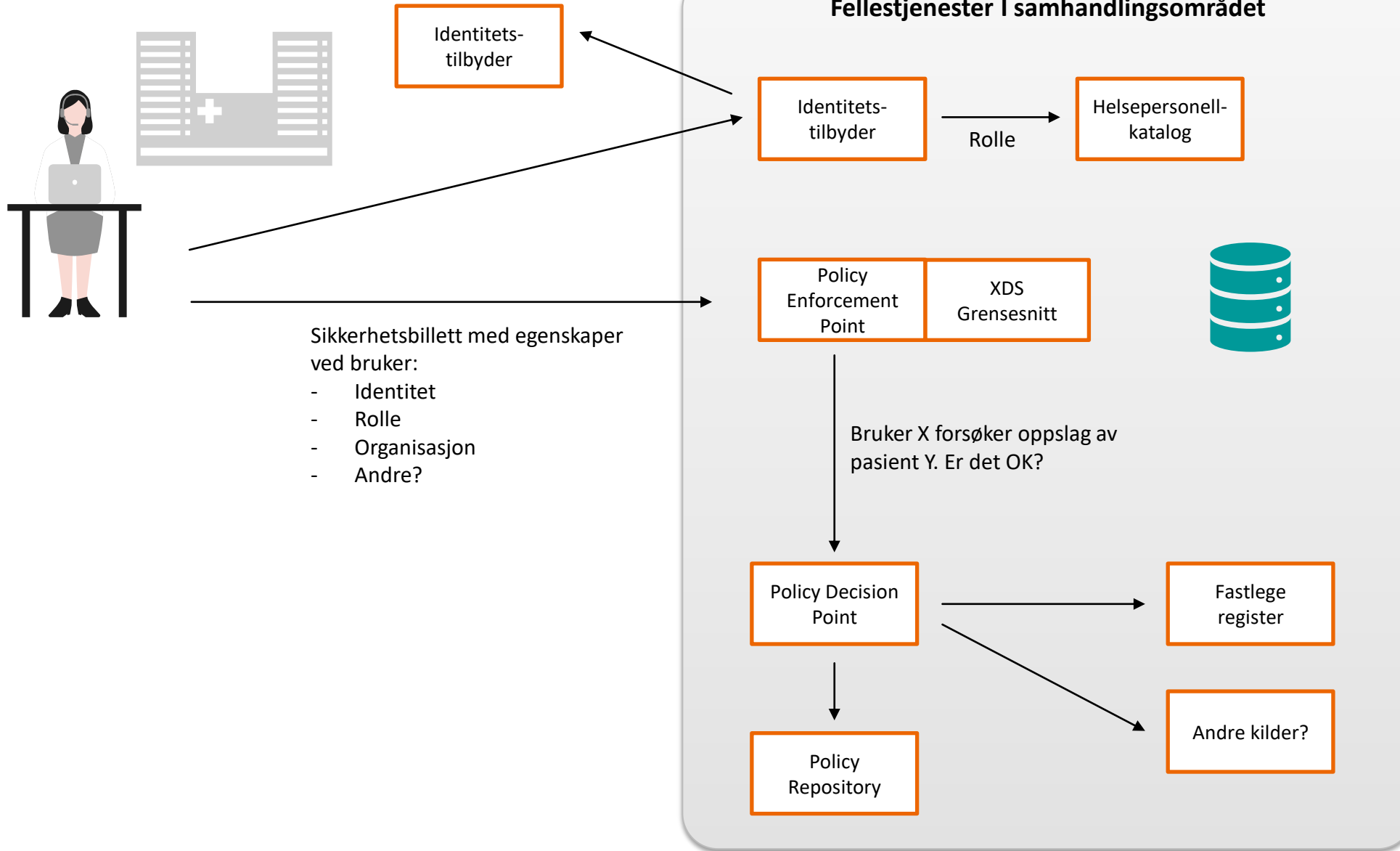
Substance	Intake	Dosage	Dispension date
Aspirin (Acetylsalicylic acid)	2 time(s) daily	1 unit	11/28/2017
Ciproxin (Ciprofloxacin)	2 time(s) daily	1 unit	11/12/2017
Proxen (Naproxen)	2 time(s) daily	1 unit	11/8/2017
Atenolol 25 MG Oral Tablet	2 time(s) daily	1 unit	3/18/2012

Bruk av strukturerte data fra dokumenter (mXDE + QEDm)

- 1.- Specific data elements are extracted from the structured documents per mXDE Profile (Mobile Cross-Enterprise Document Data Element Extraction).
- 2.- Data elements (e.g. allergies) queried using the FHIR based QEDm Profile.
- 3.- Each data element is referenced to the document(s) from which it was extracted per mXDE Profile.
- 4.- Clinician accesses context of any data element of interest using source documents (XDS, MHD Profiles) providing the clinical context in which the observation was recorded.



Tilgangsstyring I praksis



For health professionals, the following decision graph is used to verify consents:

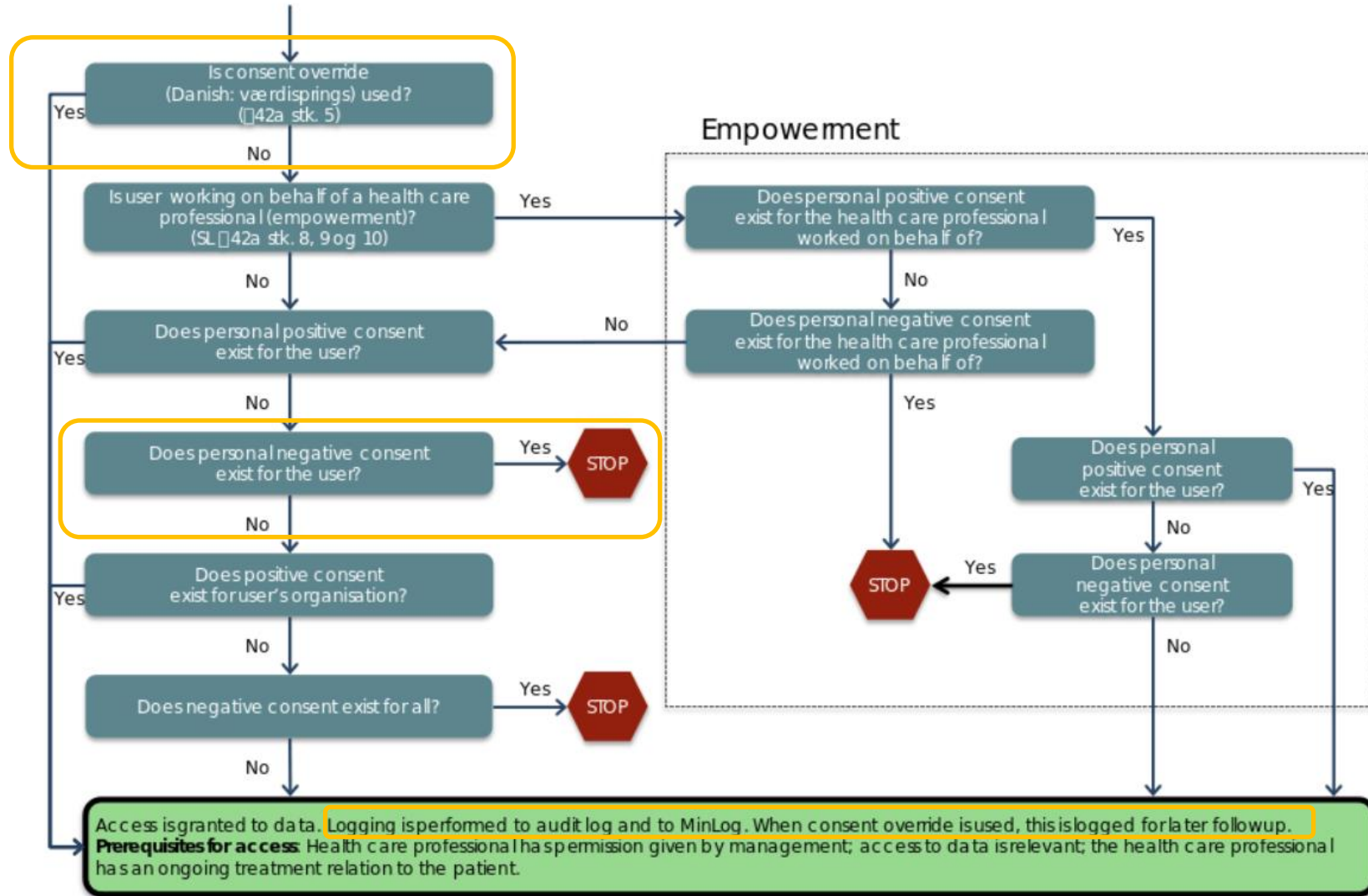


Figure 2 State diagram for consent verification steps when granting access for a health care professional to health care information about a citizen. References in parenthesis refer to [Sundhedsloven].

Empowerment (Danish: Bemyndigelse) is a state where one health care professional is working on behalf of another. The health care professional worked on behalf of is typically held accountable for the actions performed by the former.

Eksempel på en konkret XACML regelsæt implementering i Region Midtjylland

Domain policy nummer et:

- Tillad fremsøgning for sundhedspersoner af alle dokumenter hvis der er tale om en nødsituation (værdispring):

Permissions

Description

HCP role: Allow Q/R if PoU=EMERGENCY

Subjects **Kontekst information (rolle / org.)**

OR × AND × Role = Healthcare Profe AND OR

Resources **Dokument metadata**

+
New restriction

Actions **Hva kan brukeren hvis betingelser oppfylles?**

All Actions

Retrieve Documents

Register On-Demand Documents

Cross Gateway Query

Query Documents

Environments **Kontekst information (formål)**

OR × AND × Purpose of Use = Emergency AND OR

Effect

Permit

Eksempel på en konkret XACML regelsæt implementering i Region Midtjylland

Domain policy nummer to:

- Tillad fremsøgning for sundhedspersoner af dokumenter med normal fortrolighed hvis patienten er til stede

Permissions

Description

HCP role: Allow Q/R if PoU=PRESENT AND confidentiality=N AND no opt-out

Subjects **Kontekst information (rolle / org.)**

OR × AND × Role = Healthcare Profe AND OR

Resources **Dokument metadata**

OR × AND × Confidentiality Cc = Normal AND OR

Actions **Hva kan brukeren hvis betingelser oppfylles?**

- All Actions
- Retrieve Documents
- Register On-Demand Documents
- Cross Gateway Query
- Query Documents
- Update Document

Environments **Kontekst information (formål)**

OR × AND × Purpose of Use = Present AND OR

Effect

Permit if participation was not revoked (Opt-Out).

Pasientportal - Sperring

The screenshot displays a list of four documents in a patient portal. Each document entry includes an icon, a title, a date, and a source. A context menu is open over the third document, 'LaboratoryResults1007 / Laboratory report', showing three options: 'Download', 'Change confidentiality level', and 'Show metadata'. The 'Change confidentiality level' option is highlighted with an orange border.

Document Title	Date	Source	Actions
Reconsultation / Reconsultation	December 21, 2020	Narrow Ridge General Hospital	View, More
Patient_Summary_Discharge / Discharge summarization note (physician)	February 11, 2020	Westchester Clinic	View, More
LaboratoryResults1007 / Laboratory report	November 26, 2019	Central Laboratory	View, Download, Change confidentiality level, Show metadata
LaboratoryResults1126 / Laboratory report	November 26, 2019	Central Laboratory	View, More