

Nordic openEHR Collaboration Meeting

March 4th, 2025

Ongoing work at Karolinska University Hospital

Agenda

- Focus for openEHR work
- Radiology (MRI) prostate
- Patient reported data
- PoC TakeCare to openEHR
- Primary documentation of Multidisciplinary conference notes
- Pathology
- Medical Oncology Treatment

Focus for openEHR work

Focus in all projects

- openEHR modelling for primary documentation
- Data used for care and treatment
- Build forms in various source systems based on openEHR-templates rather than mappings

Radiology (MRI) prostate

Symphony project

Project details

- Innovation project in EU + Turkey
- 3 years with start October 2022
- 4 use cases
- Sweden: Prostate cancer use case



Problem

- Rising healthcare demand and staff shortages
- Clinical data are heterogeneous, complex, and siloed
- Lack of **interoperability** hinders primary and secondary use of source data



Solution

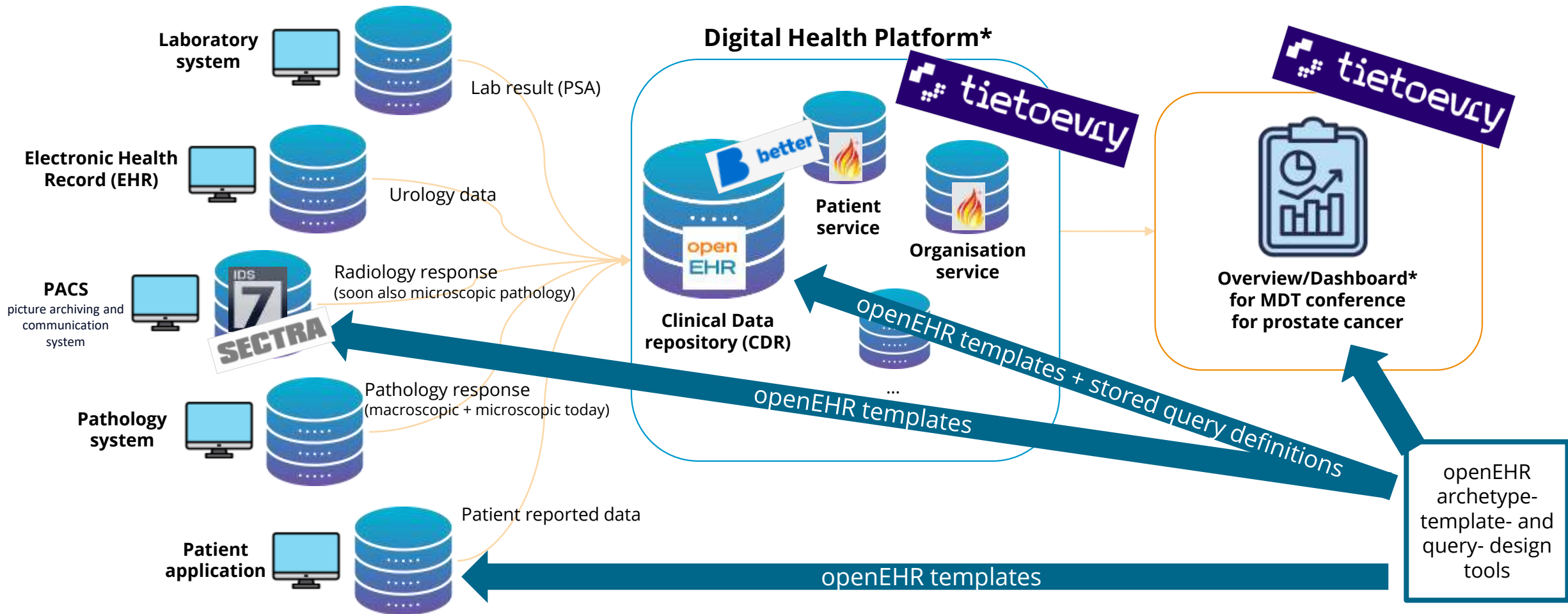
- Develop an open, interoperable healthcare IT ecosystem
- Integrate clinical workflows and data from heterogeneous sources
- Ensure the system aligns with key principles of healthcare technology integration with **structured** and **standardized** data



Effect

- Data-driven decision-making, including **predictive modelling**
- **Visualization** of complex data following the patients' disease pathway as well as guidelines
- Enhanced patient safety with reduced information loss, including **patient-reported data**
- Real-time quality reporting and feedback

Symphony architecture



Symphony project



*) Cambio also provides similar services within the Symphony project

Radiology (MRI) prostate

Jämförande undersökning (datum)

MR-teknik

Dynamisk kontrast

PSA ng/ml

Prostatatorlek x x mm

Prostatavolym ml

PSA densitet (PSAD) *PSA-angivelse saknas.*

Tertius Lob x mm

Kvalitetskommentar

Inga tumörmisstänkta förändringar i prostata

Lesion 1 ▾

Zon	<input type="text" value="Pz"/>	<input type="text" value="Tz"/>	<input type="text" value="Pz (Tz)"/>	<input type="text" value="Tz (Pz)"/>	<input type="text" value="AFS"/>	<input type="text" value="Cz"/>
-----	---------------------------------	---------------------------------	--------------------------------------	--------------------------------------	----------------------------------	---------------------------------

Sector *Lesionsannotering saknas. Markera lesionen nedan.*

RadiologyExaminationResultProstateCancer-3 (openEHR-EHR-COMPOSITION.rep)

History

Definition Form Description Analytics

RadiologyExaminationResultProstateCancer-3

- Structured imaging findings
 - Imaging examination of the prostate-2 $\Delta [0..*]$ to $[0..1]$
 - Body structure
 - Body site
 - Imaging findings
 - Additional details
 - PSA density $\Delta [0..*]$ to $[0..1]$
 - PSA density
 - Detailed prostate findings MRI-2 $\Delta [0..*]$ to $[0..1]$
 - Membranous urethral length
 - Median lobe presence
 - Median lobe depth
 - Median lobe height
 - Posterior bulge presence
 - Posterior bulge length
 - PRECISE
 - Imaging examination of a lesion in prostate-2
 - Impression
 - Comment
 - Volume
 - Width
 - Depth
 - Height

Structured technique/procedure

MRI technique details $\Delta [0..*]$ to $[0..1]$

Magnetic field strength

Contrast use

Image capturing

Laboratory test result

data

Any event

data

Test name

Overall test status

Overall test status timestamp

Diagnostic service category

Clinical information provided

Test result

Laboratory analyte result $\Delta [0..*]$ to $[0..1]$

Analyte result sequence

Analyte name

Analyte result Δ Types set changed

Reference range guidance

Test method Δ Types set changed

Imaging examination of a lesion in prostate-2 $\Delta [0..*]$ to $[0..1]$

Body site

Structured body site

Sector $\Delta [0..*]$ to $[0..1]$ NAME (from: 'Anatomical location')

Main sector NAME (from: 'Body site name')

Sector NAME (from: 'Specific site') Δ Values changed

Zone $\Delta [0..*]$ to $[0..1]$ NAME (from: 'Anatomical location')

Main zone NAME (from: 'Body site name')

Zone NAME (from: 'Specific site')

Laterality

Aspect

Anatomical Line

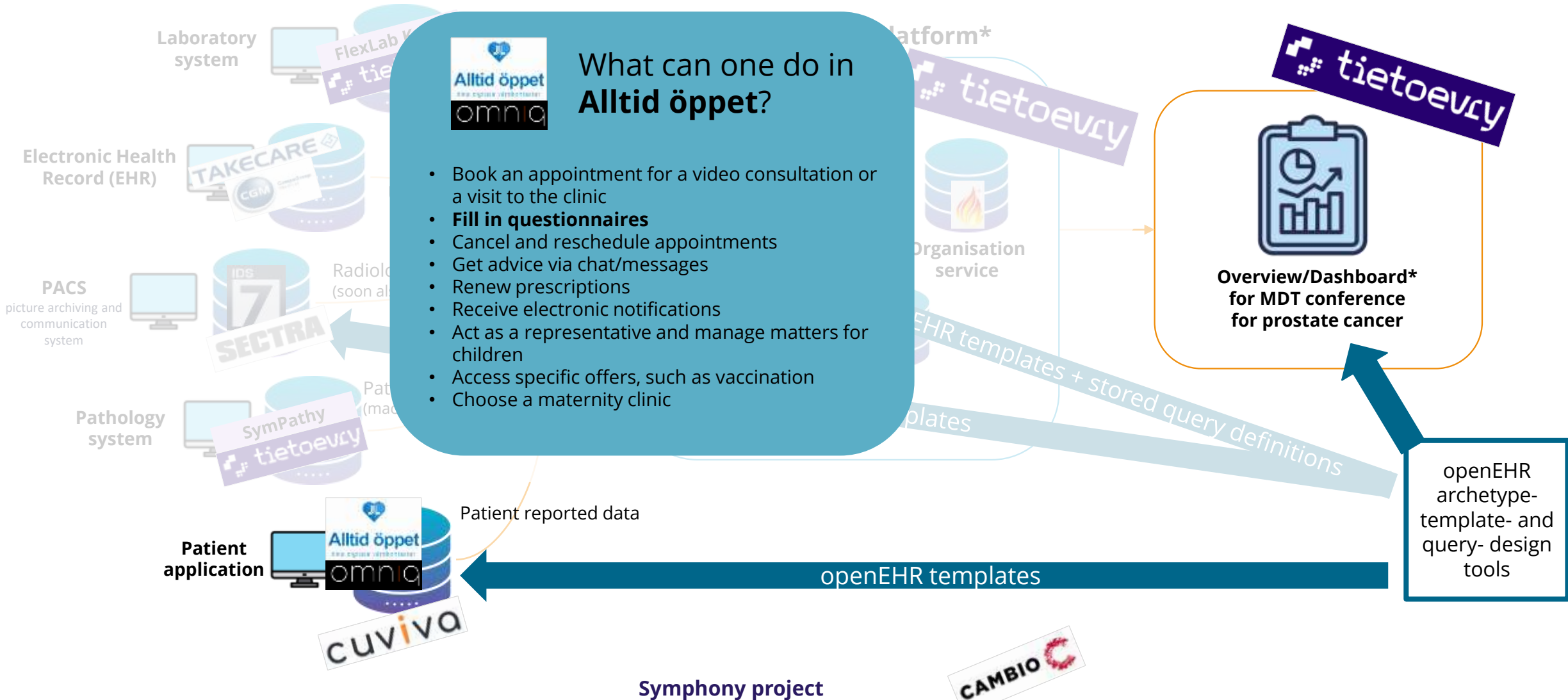
Description

Archetypes

- Existing archetypes
 - COMPOSITION Result Report (v1)
 - OBSERVATION Imaging examination result (v1)
 - CLUSTER Imaging examination of a body structure (v1) (specialization for prostate?)
 - CLUSTER Imaging examination of an anomaly (v0) (specialization for lesion?)
 - CLUSTER Anatomical location (v1)
 - CLUSTER PI-RADS v2.1 (V1)
 - OBSERVATION Laboratory test result (v1)
 - CLUSTER Laboratory analyte result (v1)
- Create new Cluster-archetypes for
 - PSA density
 - Detailed prostate findings MRI
 - Detailed lesion findings prostate MRI
 - MRI technique details

Patient reported data

Symphony architecture – Patient reported data



Symphony project



*) Cambio also provides similar services within the Symphony project

Patient reported data in the Symphony project

INTERNATIONAL PROSTATE SYMPTOM SCORE (I-PSS)

Patient Name: _____
Date: _____

	Not At All	Less Than 1 Time In 2	Less Than Half The Time	About Half The Time	More Than Half The Time	Almost Always	TOTAL SCORE
1. Incomplete Emptying Over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating?	0	1	2	3	4	5	
2. Frequency Over the past month, how often have you had to urinate again less than two hours after you have finished urinating?	0	1	2	3	4	5	
3. Intermittency Over the past month, how often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4. Urgency Over the past month, how often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Weak Stream Over the last month, how often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Straining Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5	
	None	Once	Twice	3 times	4 times	5 or more	TOTAL SCORE
7. Nocturia Over the past month how many times did you most typically get up each night to urinate from the time you went to bed until the time you get up in the morning?	0	1	2	3	4	5	
Total I-PSS Score							



Health Declaration
General & Prostate Cancer Specific

Webbformulär
(add-on to TakeCare)



Challenges

- Alltid Öppet currently does not support the import of all openEHR data types
- Webbformulär is not openEHR compatible

Access your old Systems' data with a CDR + UI/visualisation toolkit

Copying/migrating data to openEHR/FHIR-format from our old EHR system "TakeCare" before shutting it down

Project description, see post #27 in: <https://discourse.openehr.org/t/karolinska-stockholm-procurement-of-digital-health-platform-cdr-tools-services-consultants/4457/27>



31. Januar 2025

17

Konferensprogram • Conference programme

Vitalis 2025

Byt journalsystem smidigare! Lagra och nå dina gamla journalhandlingar som förr (men via standarder som openEHR och FHIR).
Tisdag 20 maj 2025 15:30 - 16:30 F-4
Föreläsare: Elisabet Rönngren Civalero, Erik Sundström, Susanne Bergerbrant Glas

Lagra och nå dina gamla journalhandlingar som förr (men via standarder som openEHR och FHIR). På tre månader lyckades vi (via API) automatiskt överföra av journaler, läkemedelsordkrav, rapporter, till en Vårdstaplattform baserad på öppna standarder som openEHR och FHIR. Under samma tid byggdes i Vårdstaplattform användargränssnitt som efterliknade struktur och funktioner (inklusive filterningar) i TakeCare så att vårdbesökarna känner igen sig och kan använda samma sorts arbetsflöden som tidigare. Detta "Proof Of Concept" (PoC) testades i praktiken ett sätt att koppla ihop till patientjournalerna. Fördel, demonstration och diskussion kommer även ta upp ytterligare möjligheter som inte ingick i PoC-uppdraget men kan vara av intresse för de som står inför att byta huvuds journalsystem eller nya gjort det.

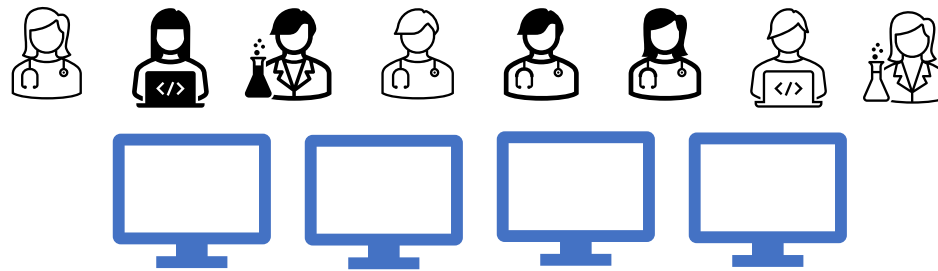
Passet är uppdelat i tre delar:

- Bakgrund, teori och konceptbeskrivning**
Bakgrund plus beskrivning av olika uttars källor, mål och koncepteringsmetoder berörande på vad som är tekniskt, informatiskt och resursmässigt rimligt. Det som är värdeladdat och går till att konvertera till internationella informationsmodeller inte smidigt att konvertera, men behöver inte heller modelleras annat än med sk "integrationsmarknader" som automatiskt "göter av" gamla journaltekniker m.m. på sätt som är ändå väldigt värdefulla för mänsklig blodning, återring och läkning. Dessutom finns hybridier där man förer "göter av" och senare konverterar. Vi jämför användargränssnitt i TakeCare med motsvarigheterna i den openEHR-baserade Vårdstaplattformen och letar fram information i realistiska kliniska scenarier.
- Demonstration av slutanvändarperspektiv**
Diskussion kommer utveckla info om projektets status/fortsättning även ta upp ytterligare möjligheter som inte ingick i PoC-uppdraget, t.ex. möjligheten att ge bättre journalöverblick genom att ta in data från flera andra system som är under utveckling och tillföra information från de nya under inskrivande.
- Framtidsmöjligheter och diskussion**

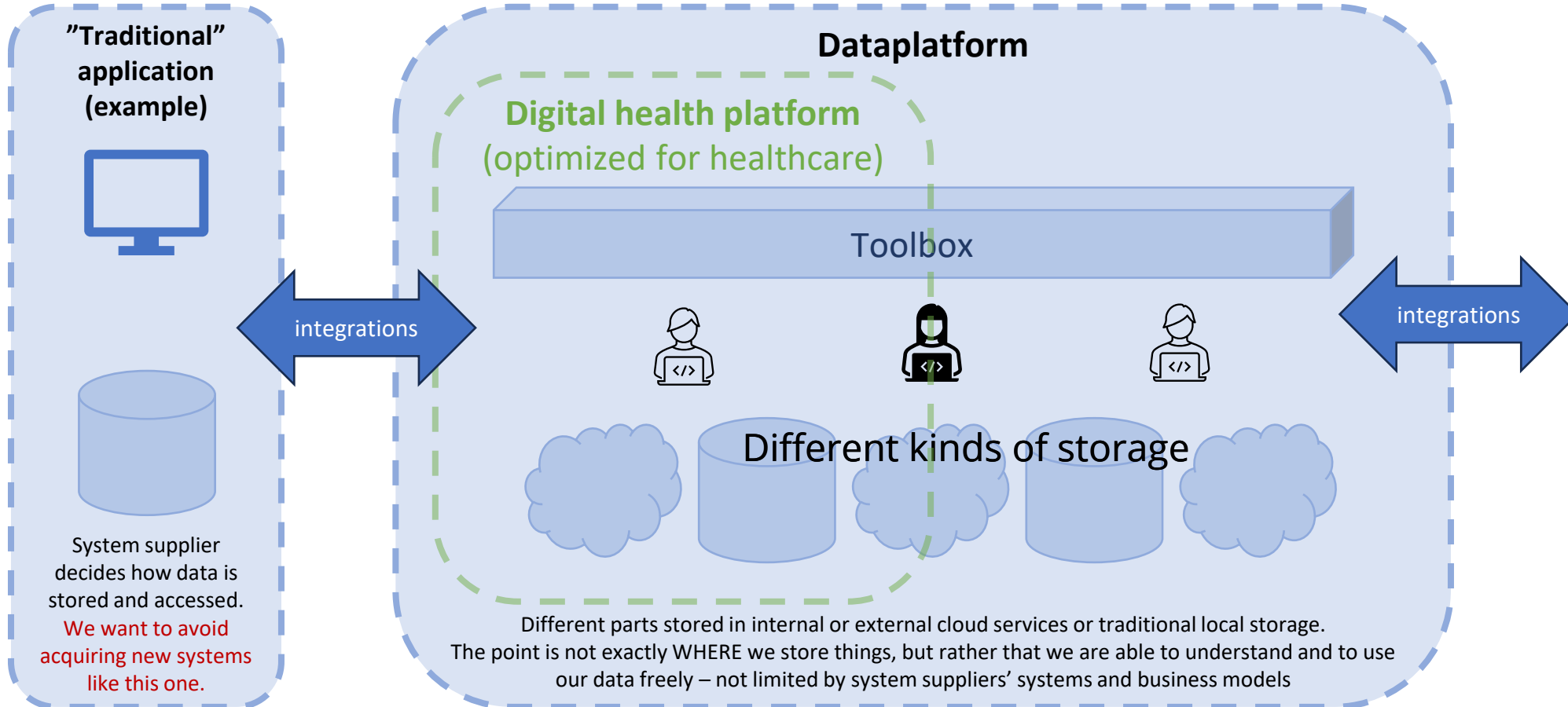
- Språk**
Svenska
- Ämne**
Data och information
- Seminarierstyp**
Live + på plats
- Föreläsningsformat**
Utökad
- Föreläsningssyfte**
Inspiration
- Kurskapsnivå**
Introduktion
- Målgrupp**
Chef/Beaktatfattare
Politiker
Verksamhetsutveckling
Upphandlare/IKO/ekonomi/FIR
Tekniker/IT/utvecklare
Vårdbesökare
- Nyckelord**
Exempel från verkligheten (poda/dåliga)
Nytt/effekt
Styrning/Förvaltning
Test/validering
Dokumentation
Appar
Användbarhet
Informatik/interoperabilitet

PoC TakeCare to openEHR

1h, in Swedish, May 20 @ Vitalis <https://invitepeople.com/events/bd0a6002b4/seminars/82887> (+ previously ~10m @HiGHmed)



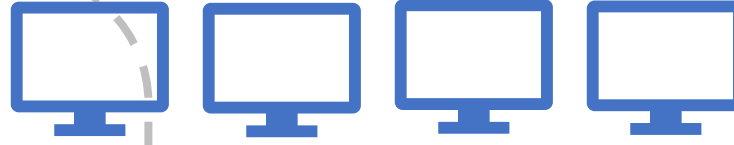
Various views and applications. Purchased or developed by ourselves.





New main EHR

...if partially or fully open/standardised,
then it will fit somewhere here



Various views and applications. Purchased or developed by ourselves.

"Traditional" application (example)

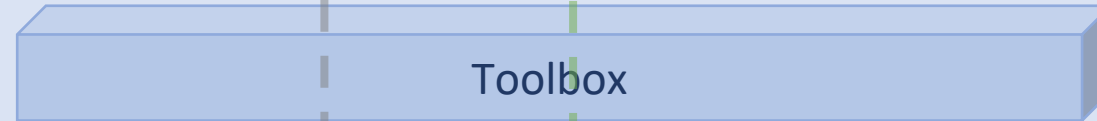


System supplier decides how data is stored and accessed.
We want to avoid acquiring new systems like this one.

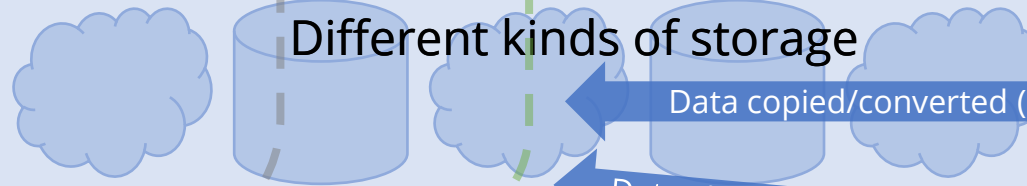


Dataplatform

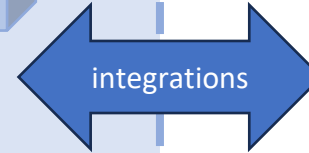
Digital health platform (optimized for healthcare)



Different kinds of storage



Different parts stored in internal or external cloud services or traditional local storage.
The point is not exactly WHERE we store things, but rather that we are able to understand and to use our data freely – not limited by system suppliers' systems and business models



Specialized EHRs/EMRs

LIMS

RIS/PACS

Patient Monitoring

PDMS

~~Shutdown ~2030(?)
Current main EHR~~

New main EHR
...if legacy monolith

...

Data copied/converted (see following slides)

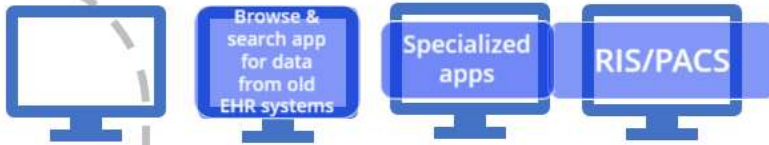
Data should be copied/converted already from start

- Patient reported data openEHR CDR
- Clinical data openEHR CDR
- Images MMA
- Omics data GDR
- Waveform data TSDB
- Operational data Demographics/FHIR
- Production data EDW



New main EHR

...if partially or fully open/standardised, then it will fit somewhere here



Various views and applications. Purchased or developed by ourselves.

"Traditional" application (example)



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...

Data copied/converted (see following slides)

Data should be copied/converted already from start

Reuse our material in a procurement of your own... ...also our PoC results are open for reuse

Swedish name & Category # above	English name + comments	Main API in TakeCare
Läkemedel (cat. #1)	Medications. The source API is fairly well documented and has limited variability.	Xchange (XML) API: Medications. MedicationHistoryGet
Journaltext (cat. #2)	Clinical notes (forms). Huge variability in size, structure, and content.	Xchange (XML) API: CaseNote. CareDocumentationGet
Kemlabb (cat. #1)	Clinical Chemistry (a lot of analysis and mapping is already done). The mapping/conversion should be general and cover any value from the source, but for the visualization at least the following are of special demo-interest (Swedish terms) <ul style="list-style-type: none"> - P-glukos CGM - P-Kreatinin - P-Alaninaminotferas (ALAT) 	Juno (JSON) API: <ul style="list-style-type: none"> .../lab/replies/chemistry .../lab/replies/chemistry/{documentid} etc.
Mätvärden (cat. #3)	Measurements. Uses a kind of forms/templates (there are more than 1000). Map at least these also to CKM-based form: <ul style="list-style-type: none"> - NEWS2 Score and several vital parameters it is depending on - Blood Pressure (there might be more than one "mätvärde" as source) - Height, Weight, BMI - If time allows, also some other values we have shortlisted as useful for a patient overview/dashboard 	Juno (JSON) API: <ul style="list-style-type: none"> .../measurements .../measurements-index .../measurements/{measurementDocumentid} etc.
Aktiviteter (cat. #1)	Activities. Variation is mainly in the terminology used, not in structure	Juno (JSON) API <ul style="list-style-type: none"> .../activities etc.
Bokningar (cat. #4)	Appointment bookings.	Juno? (JSON) might be in a data dump rather than via API

1 FTE consultancy from each of two expertise areas:

A. Informatics focus
[freshEHR won]

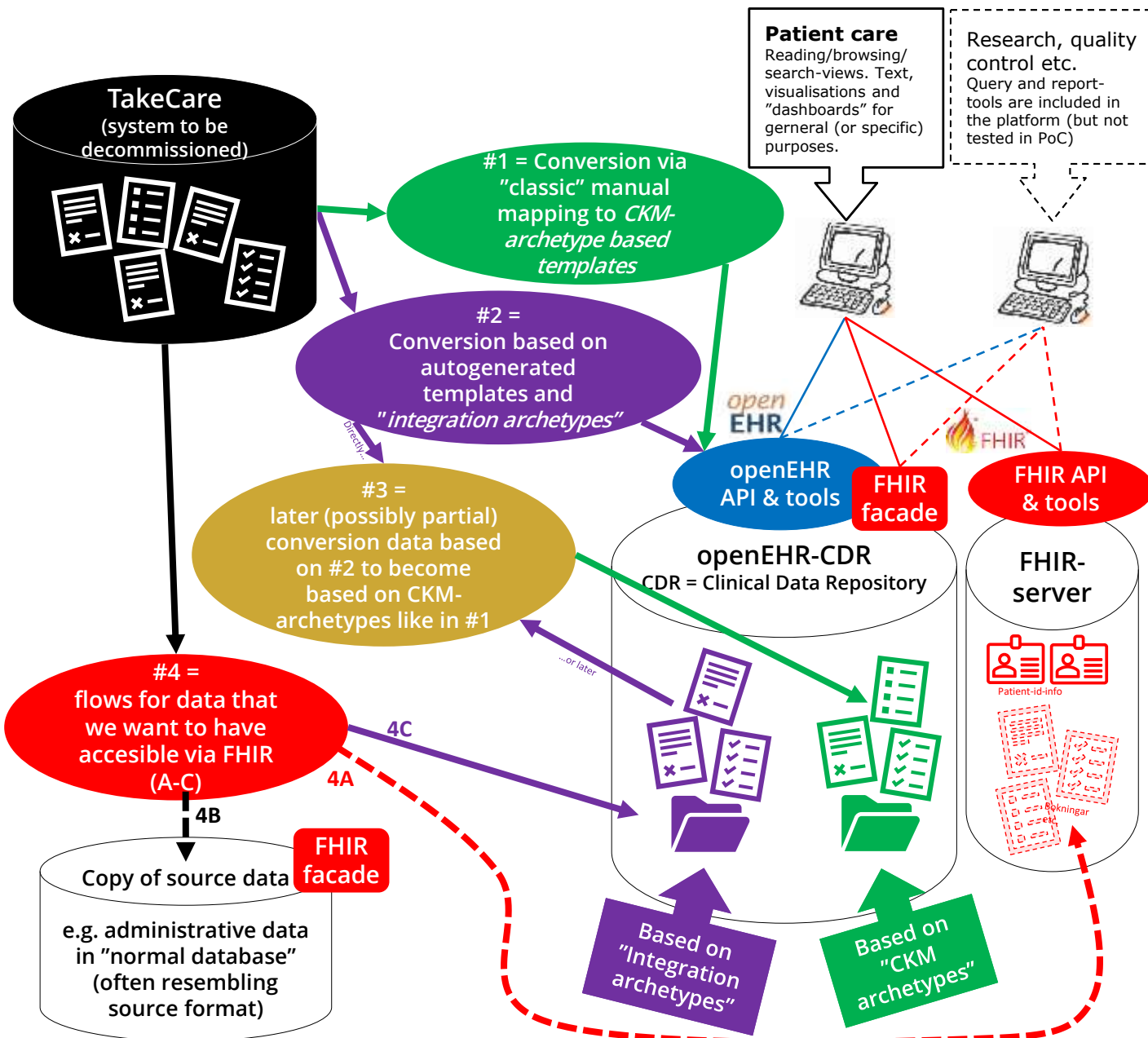
B. Integration & visualisation focus
[Tietoevry won]

Project length:
3 months

The prime target category & method candidates are:

#1	<p>openEHR COMPOSITIONS based on templates mainly based on internationally designed archetypes available in CKM (https://ckm.openehr.org/)</p> <ul style="list-style-type: none"> This kind of conversion is realistic for source information types that have well defined APIs and data structures with limited variability of content. This kind of conversion consists mainly of manual template modeling (and possibly some archetype creation if anything is missing in the CKM) followed by manual modeling of mappings from attributes in source format to content, according to this modeled mapping, shall then be automated using some appropriate tool/service.
#2	<p>openEHR COMPOSITIONS based on templates based on generated integration archetypes using e.g. openEHR's GENERIC_ENTRY. (See https://specifications.openehr.org/releases/R3/Attest/Integration.html)</p> <ul style="list-style-type: none"> This kind of conversion is realistic for sources that follow a generic model (somewhat analogous to openEHR's RM) and that also has a catalogue listing the forms/templates and terminology subsets defined in the source system. Manually mapping thousands of these would not be realistic from a resource- and cost/benefit-perspective. <ul style="list-style-type: none"> In TakeCare that catalogue is thousands of "mallar" (forms/templates) each based in a number of "sökord" (keywords/headings). There are thousands of "sökord" and they are partly reused between categories of algorithms/programs An algorithm on a "schema" level that takes the catalogue of source system forms/templates and automatically converts them to integration archetypes and templates. Another algorithm on an "instance" level that iterates over the EHR content in the source system for a patient and translates it to openEHR COMPOSITIONS based on the previously generated integration archetypes and templates.
#3	<p>openEHR COMPOSITIONS based on #2 (algorithmically designed) templates but in some cases also converted to COMPOSITIONS based on #1 (manually designed) templates.</p> <ul style="list-style-type: none"> This kind of conversion is realistic for source categories where there is too much variation in the source to have time to manually model and map everything (so mainly #2 – the algorithmic way will be used), but where we know that it would be of high value to have some selected subcategory of the data or parts of it (also manually mapped and converted to templates mainly based on internationally designed archetypes available in CKM. In TakeCare this can for example be the thousands of different "mätvärden" (measurement observations) where we want to select some subcategories of great value (e.g. Pulse, Blood pressure etc.) and have those also mapped also to COMPOSITIONS based on templates based on proper CRM archetypes. This kind of conversion likely will consist of a first automated step of type #2 (algorithmically designed) and stored in the CDR. For some subcategories this will then be followed by a step based on further conversions of type #1 (manually designed) and stored again in the CDR in the new CKM-based format but also including a link to the corresponding COMPOSITION based on "Integration archetypes" that was originally stored. This way also context not possible to convert to "proper" CKM-based format can be read by staff accessing the information at a later point in time.
#4	<p>FHIR resources based on national or regional/local FHIR profiles.</p> <ul style="list-style-type: none"> This kind of conversion is realistic for source categories that we have deemed valuable to have accessible primarily in FHIR format, for example some administrative information. This kind of conversion can be done in at least two ways <ul style="list-style-type: none"> either by converting source data to FHIR format and store the converted data in a FHIR server. (Via our contract with Tietoevry we have the FHIR services included in Better Platform available, we also have experience running the opensource HAPI FHIR Server.) or extracting and storing database posts from the source system in a format close to the source system's format and creating a FHIR facade that can be accessed. The storage should then be done in a database we can keep running after TakeCare has been decommissioned. (We have e.g. PostgreSQL and Couchbase available in our internal cloud at Karolinska)

Variants of conversion/mapping used in PoC



Conversion strategies

- CKM-archetypes** = international or national standardised openEHR structures
- Integration archetypes/templates** = locally/custom developed structures that copy the structure of the source system
- Combination (of 1+2)** = first converted using **integration archetypes** and in a later step, either **immediately** or (even years) **later**, some (or all) values are converted also based on **CKM-archetypes**
- FHIR** = international standard for integrations, used e.g. for some administrative data in Karolinska's Digital Health Platform. There are (at least) three solution patterns:
4A. FHIR-resources in a FHIR-server (direct conversion, before storage)
4B. Store in a database copied from source system, expose via "FHIR-facade"
4C. Store openEHR-integration-archetype-based in CDR expose via "FHIR-facade"

Priority ordered* data from TakeCare, colour coded as planned at start of project:

- Medications, #1** – TC Exchange (XML), well defined API
- Clinical notes (forms), #2** – TC Exchange (XML), thousands of forms/templates and headings. Huge variations in structure/modelling.
- Clinical Chemistry, #1** – TC Juno (JSON), some modelling and partial mappings were available. Well defined API.
- Measurements, #3** – TC Juno (JSON), thousands of different legacy source templates. Some were converted to CKM-archetype-based
- Activities, #1** - TC Juno (JSON), variation in terms, fixed structure in TakeCare
- Appointment Bookings, #4** – TC Juno (JSON) raw data-dump, interesting to expose via FHIR

*) We listed some more than we expected that the consultants would have time for, but it went surprisingly well! All types were mapped and converted. All were visualized in GUI except the last one (Appointment Bookings) before time ran out.

OpenEHR Flicka10
20 140219-2387

Ålder: 10 år 8 mån Gatadress: Testvägen 11 Husläkare: <saknas> Frkort: <saknas>
Kön: Kvinna Postadress: 132 43 Ehrstad Vårdcentral: <saknas>

Läkemedelsjournal - 20 140219-2387 OpenEHR Flicka10

Läkemedelslista Tidsöversikt Administrering Infusioner Oxygenbehandling Alla läkemedel Receptförskrivning Vaccinationer

Läkemedelslista Visa NLL

Ord. gäller fr.o.m.	Dos	Rek	Preparatnamn	Styrka	Läkemedelsform	Adm.väg	Adm.metod	Typ	Dosbd	Adm tf	Ord. gäller t.o.m.	Signerad	Signerad av	Skapad
2024-09-07	:	Rek	Insulin Lispro Sanofi	100 enheter/ml	Injektionsvätska, lösning	Intravenöst	Pump	Bhs	se bhs		Tillsvidare	2024-09-06	Anna-Maria Nygren	Testenh
2023-04-02		Rek	Insulin Aspart Sanofi	100 e/ml	Injektionsvätska, lösning i förfylld injektionspenna	Subkutan		Vb	10 E E		Tillsvidare	2024-11-11	Susanne Bergenbrant Glas	Testenh
2024-11-14		Rek	Alvedon	500 mg	Filmtabletter	Oralt		Vb	1 st		Tillsvidare	2024-11-14	Susanne Bergenbrant Glas	Testenh

TakeCare

20140219-2387 OpenEHR, Flicka10
10år kvinna

TakeCare läkemedel

Ord. gäller fr.om	Preparatnamn	Styrka	Läkemedelsform	Adm. väg	Doseringstyp	Dosering	Dosanvisning	Ord. gäller t.o.m	Signeratdatum	Signerad av	Vårdenhet
2024-11-14	Alvedon	500 mg	Filmtabletter	Oralt	Vb	1	<1 tabletter vid behov mot smärta. Max 6 st per dygn>	2024-11-14	2024-11-14	Susanne Bergenbrant Glas	Karolinska ÖV
2024-11-11	Insulin aspart Sanofi	100 E/ml	Injektionsvätska, lösning i förfylld injektionspenna	Subkutan	Vb	10 E	<10 E E injektionsvätska, lösning i förfylld injektionspenna vid behov diabetes. Max 20 E per dygn>	2024-11-11	2024-11-11	Susanne Bergenbrant Glas	Privat ÖV
2024-09-07	Insulin lispro Sanofi	100 enheter/ml	Injektionsvätska, lösning	Intravenöst	Bhs	se bhs	<enligt separat behandlingsschema>	2024-09-06	2024-09-06	Anna-Maria Nygren	SLSO ÖV

PoC

Take Care



#1 CKM ark.

Clinical notes (forms)

PoC

19520729-1591 OpenEHR, Man72
T2år rean

TakeCare journal

Fr. m datum och tid: yyyy.MM.dd HH:MM To m datum och tid: yyyy.MM.dd HH:MM

Välj yrkesroll: Välj journalmall: Välj sökord: Välj vårdenhet: Stäng Filtrera

Datum, tid	Yrkesroll	Journalmall	Vårdenhet
2024-11-03 14:29	Läkare	Operationsberättelse	Karolinska SV
2024-08-29 12:06	Läkare	Nybesöksanteckning	Karolinska ÖV
2024-08-29 10:57	Läkare	Remissbedömning	Karolinska ÖV
2024-05-14 10:49	Läkare	Nybesöksanteckning	Öppenvårdsmott. Urologi
2024-01-20 16:09	Läkare	Besöksanteckning	Visby ÖV
2023-09-14 16:01	Läkare	Nybesöksanteckning	Visby ÖV
2023-01-05 15:42	Läkare	Daganteckning	

2024-08-30 14:09:38 Claudia Ehrentraut Läkare Karolinska ÖV (Signerad)

Nybesöksanteckning

Remittent: Jenny Jensen Urolog

Kontaktersak: Prostatacancer, behandlingsdiskussion

Anamnes:

Sociellt: Gift och 3 utflyttade barn. Pensionär efter ett liv i byggbranschen.

Ärlighet: Ingen känd

Tidigare sjukdomar: Opererad för diskbräck 2015

Nuvarande sjukdomar: Ulcerös kolit, omedicinerad, i inaktiv fas för närvarande.

Tobak: Icke rökare

Aktuellt: Diagnostiserad med prostatacancer 2018, nu uppgraderad efter stigande PSA med hög PSA-densitet. MR och fusionsbiopsi mot två lesioner i 34Cd respektive 2Av där man funnit 70% Gleason 4-mönster. Cancer i totalt 4 av 7 fusionsbiopsier. Systematiska biopsier med Gleason 3+4 med oklar lokalisering. Tidigare palperad u.a. Patienten har LUTS med primärt urgency och nedsatt erektil funktion.

Status

Allmäntillstånd: Gutt och opåverkat

Rektalundersökning

T (DRE): 2

Sida: vänster

Bedömning: En 72-årig man med uppgraderad prostatacancer enligt övan. Har bilateralt strålning och kirurgi hos intermitterande. Patienten bedöms operabel på MR med vänstersidig ventral EPE 4 samt tydlig konsistensförändring på vänster sida.

Öer skriftlig information och går igenom riskerna för inkontinens och impotens som följer av robotassisterad prostatektomi. Patienten önskar ytterligare betänketid. Vi planerar höra per telefon inom två veckor för ett beslut om behandling.

Take Care

#2 integr. ark.

Sök/välj patient Testenhet 17 **CSTC Int

OpenEHR Man72
19 520729-1591

Älder: 72 år Getadress: Testvägen 14 Husläkare: < Kän: Man Postadress: 132 43 Ehrstad Vårdcentral:

Journaltext - 19 520729-1591 OpenEHR Man72

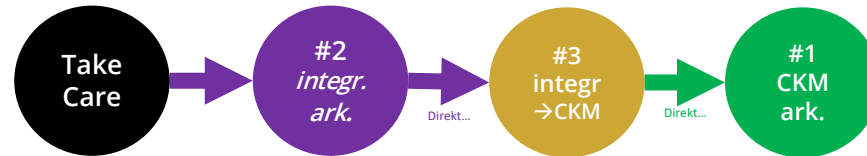
Journalmall: <Samtliga> Yrke: <Samtliga> Sökord: <Samtliga>

Sida 1 av 1

Tid	Yrke	Journalmall	Vårdenhet
24-11-03 14:29	Läk	Operationsberättelse	Testenhet 5** CSTC SLV
24-08-29 12:06	Läk	Nybesöksanteckning	Testenhet 17 **CSTC Int
24-08-29 10:57	Läk	Remissbedömning	Testenhet 17 **CSTC Int
24-05-14 10:49	Läk	Nybesöksanteckning	Öppenvårdsmott. Urologi
24-01-20 16:09	Läk	Besöksanteckning	Visby-VC Slite
23-09-14 16:01	Läk	Nybesöksanteckning	Visby-VC Slite
23-01-05 15:42	Läk	Daganteckning	Testenhet 5** CSTC SLV
22-11-08 10:57	Läk	Nybesök Vårdcentral	Testenhet 4** SLSO Prim
22-07-06 15:38	Läk	Telefonkontakt utan besök	Testenhet 4** SLSO Prim
20-03-11 08:24	Läk	Läkemedelsgenomgång	Testenhet 17 **CSTC Int

TakeCare

TakeCare



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Måttvärden/Laboratorievärden - 19 520729-1591 OpenEHR Man72

Filter

20-03-11 22-11-08 23-09-14 23-09-23 24-01-20 24-05-14 24-08-27 24-08-29 24-10-23

08:24 10:57 08:25 10:09 08:00 10:11 16:04 10:46 09:43 16:00 09:00 08:46

PVK 2, stöckforsök
 PVK 1, storlek
 PVK 2, storlek
 Alkohol
 Blodtryck systoliskt - övre
 Blodtryck diastoliskt - nedre
 BMI
 Centrala verktyger (CVK) In/Ur/Byte
 S-mått avstånd
 Invasivt blodtryck systoliskt
 Invasivt blodtryck diastoliskt
 Kroppstemperatur
 Kroppsvikt även enl Musteller
 Kroppsvikt vuxen enl Dubois uträ...
 Längd
 PCVK In/Ur/Byte
 Perifer verktyger (PVK) 1 In/Ur/Byte
 Perifer verktyger (PVK) 2 In/Ur/Byte
 P-PSA
 Självskattad hälsa
 Urinkateter (KAD) In/Ur/Byte
 vikt

Information om markerat värde

Måttvärde, namn: **PVK 1, placering**
Svar: **Underarm**

18** 20** 21,5

19520729-1591 OpenEHR, Man72

728 min

TakeCare måttvärden

20 okt, 2024 - 4 nov, 2024

Idag

Parametrar

	so 20	må 21	ti 22	on 23	to 24	fr 25	lo 26	so 27	må 28
Längd				183					
PCVK In/Ur/Byte				0					
Perifer verktyger (PVK) 1 In/Ur/Byte				0					
Perifer verktyger (PVK) 2 In/Ur/Byte				2					
PVK 1, placering				2					
PVK 1, sida				0					
PVK 1, stöckforsök				3					
PVK 1, storlek				1					
PVK 2, placering				5					
PVK 2, sida				1					
PVK 2, stöckforsök				0					

PoC

BMI-beräkning

BMI

21.2 ↓

4 veckor 1 dag sedan

Längd - cm

183 ↗

4 veckor 1 dag sedan

Vikt - kg

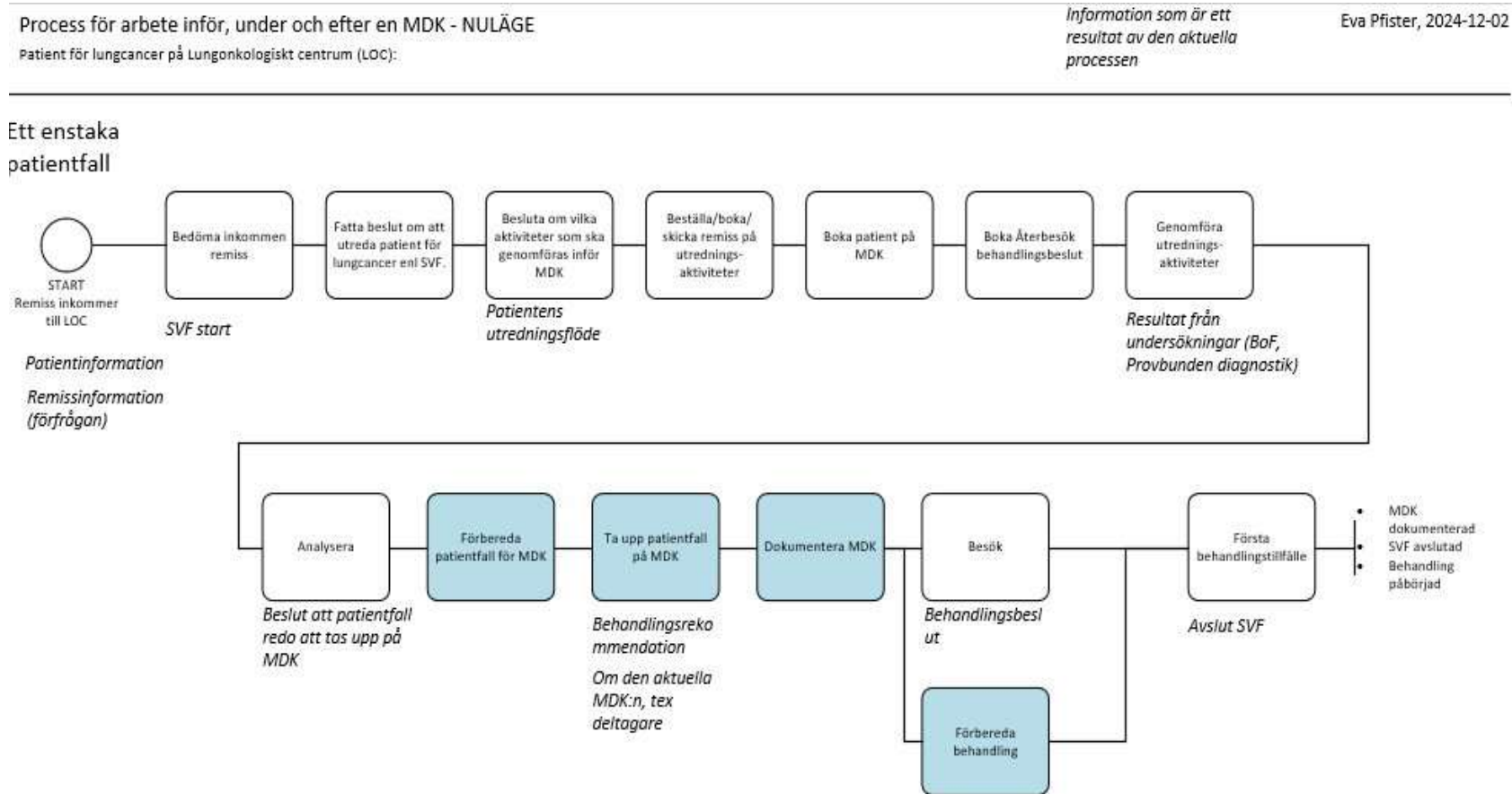
71 ↓

4 veckor 1 dag sedan

Primary documentation of Multidisciplinary conference notes

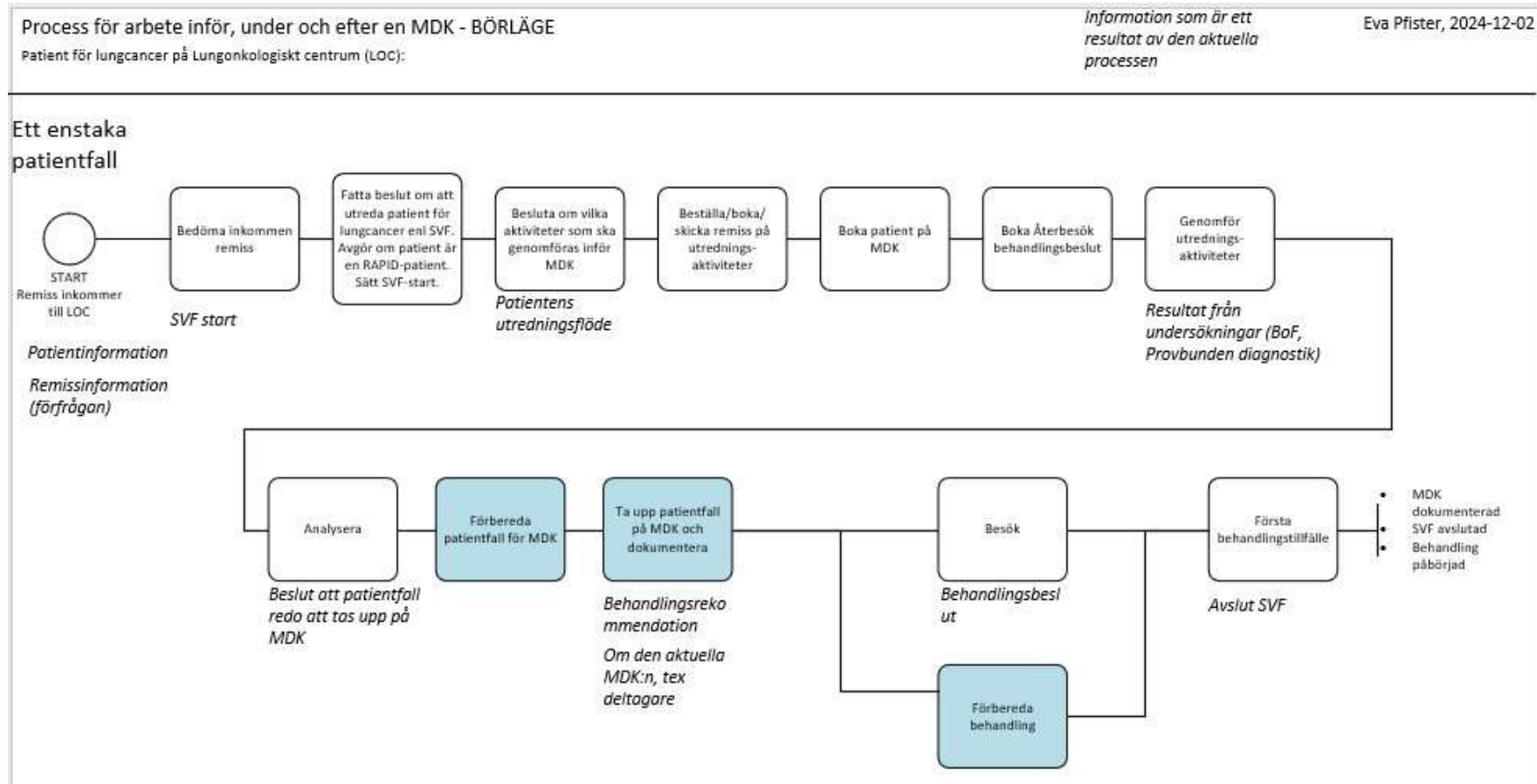
Primary documentation of Multidisciplinary conference notes

Current work process



Primary documentation of Multidisciplinary conference notes

New work routine



Primary documentation of Multidisciplinary conference notes

Preview: MDK Lungcancer Validate Restore data Save composition

Bakgrund/Anamnes

> Funktionsutredning

> Undersökningar

> Bedömning/Stadiumindelning

Huvudbehandling

Ange behandlingsmodalitet
Medicinsk onkologisk behandling x

Behandlingsintention

Palliativ

Kurativ

Ännu oklart

Medicinsk onkologisk behandling

Typ av Medicinsk onkologisk behandling

Kemoterapi Målinriktad behandling Immunoterapi Endokrin behandling

Annat

Ange typ av substans/regim i fritext

Kommentar

Kommentar

Tilläggsbehandling i förhållande till huvudbehandling

Ange behandlingsmodalitet
Radioterapi x

Behandlingsintention (tilläggsbehandling)

Palliativ

Kurativ

Förebyggande

Ännu oklart

Radioterapi (tillägg)

Typ av radioterapi

SRRT

Totaldos

Pathology

Pathology

- National quality and standardization committees (pathologists) per organ
- National working group: structured pathology information
 - Domain expertise (pathologists, BMAs, surgeons and oncologists)
 - Information architects
 - Snomed CT expertis

In sync with:

- International Collaboration on Cancer Reporting (ICCR)
- International openEHR-modelling of pathology information

Pathology: Goal - forms with built-in knowledge support

Domain expertise

Information content decided by domain expertise

Kvalitetsdokument för bröstpatologi

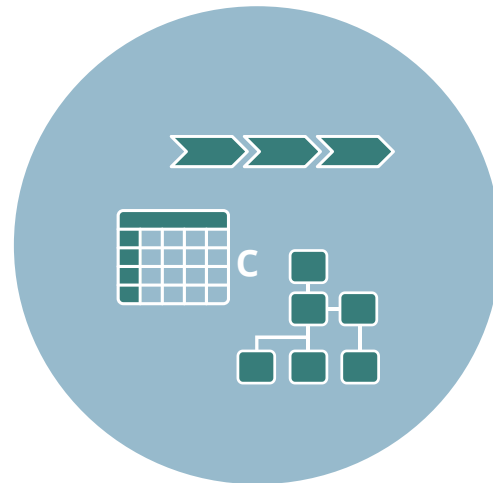
Bilaga till Nationellt vårdprogram för bröstcancer

2022-03-17, Version 4



National group structured pathology information

Structuring of information content, logic & business rules



Standardization of information (Snomed CT, openEHR)



Histopathology laboratory

Implemented forms in relevant healthcare information systems

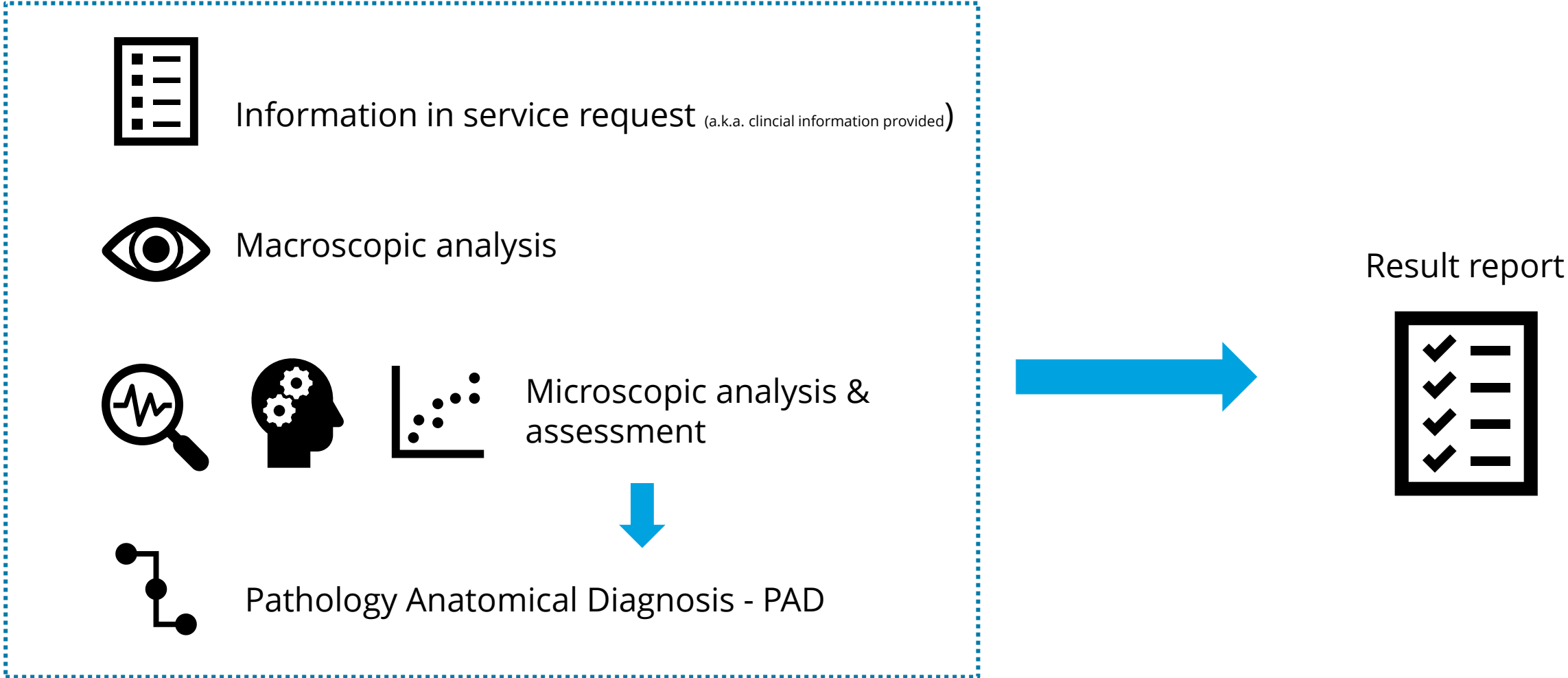


National working group structured pathology information

Configuration material:

- Patient flow models
- Concept models
- Information models (UML) + terminology binding to Snomed CT
- openEHR-templates + terminology binding to Snomed CT
- Documented triggers, business rules, calculations, logic etc.
- Form prototypes

Pathology Result Report – documentation on different occasions and by different individuals



Pathology Breast – Surgically Removed Specimen

openEHR Templates

- Service request to Clinical Pathology
- Documentation of macroscopy analysis and assessment – breast
- Documentation of macroscopy analysis and assessment – lymph nodes
- **Documentation of microscopy analysis and assessment – breast** (in progress)
- **Documentation of microscopy analysis and assessment – lymph nodes** (in progress)

Mindmap openEHR-modelling of microscopic analysis and assessment of breast tissue and lymph nodes:

[Mikroanalys operationspreparat bröst.xmind - Xmind AI](#)

Pathology Breast – Surgically Removed Specimen

openEHR Archetypes

Existing archetypes

- Composition: Result report (v.1)
- Observation: Laboratory test result (v.1)
- Cluster:
 - Specimen (v.1)
 - Anatomical location (v1)
 - Circular anatomical location (v1)
 - Relative anatomical location (v.1)
 - Specimen measurements (v.1)
 - Anatomical pathology exam (v.0)
 - Surgical resection margins (v.0)

New archetypes

Cluster:

- Microscopy findings (v.0)
- Tumor resection margin (v.0)
- Molecular analysis (v.0)
- Invasive breast carcinoma microscopy (v.0)
- Breast carcinoma in situ (v.0)
- Breast tumor panel (v.0)

Pathology Prostate - Core Needle Biopsy

In progress:

- Patient flow model
- Service request

Planned:

- Macroscopic analysis
- Microscopic analysis

Medical Oncology Treatment

Medical Oncology Treatment – openEHR Archetypes

Existing archetypes

- Composition: Prescription (v.0) & Encounter (v.1)
- Instruction: Medication Order (v.3)
- Action: Medication Management (v.1)
- Section: Ad hoc heading (v.1)
- Cluster:
 - Medication details (v.2)

New archetypes

- Cluster:
 - Medication regimen (v.0)
 - Medication trial (v.0)

Medical Oncology Treatment - Prescription

OrdineradMedicinskOnkologiskBehandling_MedKurdag *NAME (from: 'Prescription')*

→ context

→ other_context

Extension

Care unit v2 $\Delta [0..*]$ to $[0..1]$ *NAME (from: 'Extension')*

Medication regimen $\Delta [0..*]$ to $[1..1]$

Regimen name $\Delta [0..1]$ to $[1..1]$

Regimen protocol version

Course/cycle number

Medication trial $\Delta [0..*]$ to $[0..1]$

Clinical trial medication?

Trial name

→ content

Prescription per course day $\Delta [0..1]$ to $[0..*]$ *NAME (from: 'Ad hoc heading')*

→ items

Medication order $\Delta [0..1]$ to $[1..1]$

→ activities

Order

→ description

T Medication item

Medication details

Medication details

Details per substance $\Delta [0..1]$ to $[1..1]$ *NAME (from: 'Medication details')*

Substance $\Delta [0..1]$ to $[1..1]$ *NAME (from: 'Name') Δ Values changed*

Form $\Delta [0..*]$ to $[1..1]$

Prescribed dose $\Delta [0..1]$ to $[1..1]$ *NAME (from: 'Amount')*

Route $\Delta [0..*]$ to $[1..1]$

Medication safety

Therapeutic intent $\Delta [0..*]$ to $[0..1]$

Order details

Dispense directions

→ protocol

Scheduled administration per substance $\Delta [0..1]$ to $[1..*]$ *NAME (from: 'Medication management')*

→ ism_transition

Medication start date/condition set

→ description

Medication details

Medication details

Substance $\Delta [0..1]$ to $[1..1]$ *NAME (from: 'Name') Δ Values changed*

Administration details

→ protocol

Order ID $\Delta [0..*]$ to $[0..1]$

Medical Oncology Treatment - Administration

Administrerad Medicinsk Onkologisk Behandling Per Substans NAME (from: 'Encounter')

- context
 - other_context
 - Extension
 - Care unit v2 Δ [0..*] to [0..1] NAME (from: 'Extension')
- content
 - Reason for encounter
 - data
 - Main diagnosis for encounter NAME (from: 'Presenting problem') Δ Values changed
 - protocol
 - Administered medication therapy Δ [0..1] to [0..*] NAME (from: 'Medication management')
 - ism_transition
 - Medication course completed
 - description
 - Medication details
 - Substance details Δ [0..1] to [1..1] NAME (from: 'Medication details')
 - Substance NAME (from: 'Name') Δ Values changed
 - Administered dose Δ [0..1] to [1..1] NAME (from: 'Amount')
 - Amount
 - protocol
 - Order ID Δ [0..*] to [1..1]