Pre Procurement Demo

DIPS EHR Craft

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ENABLING EFFICIENT HEALTHCARE

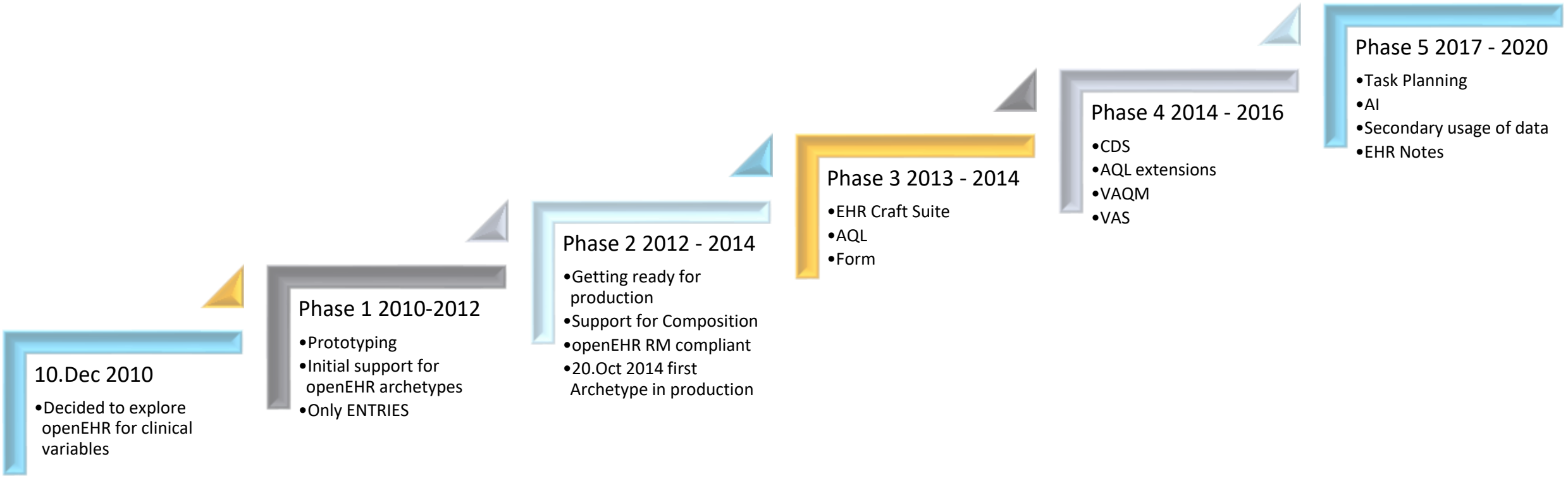
DIPS

Agenda

openEHR in DIPS Arena (presentation)

openEHR Tools in EHR Craft (demonstration)

The openEHR journey in DIPS

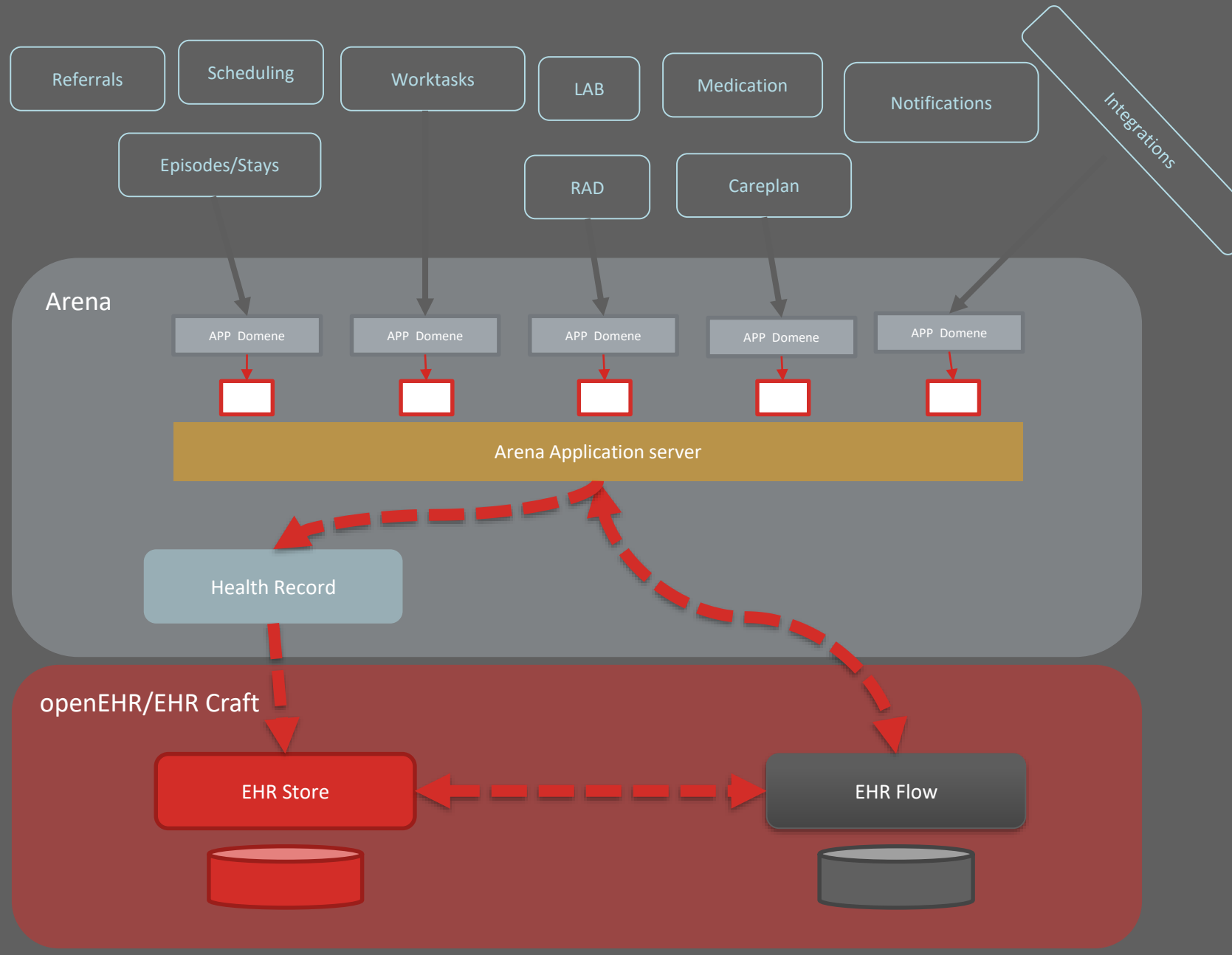


openEHR is a core part of our EMR, DIPS Arena.

It’s an integrated part and is used to handle the structured clinical data from different modules.

EHR Craft is the suite of services and tools to support the development of openEHR based application and the core CDR and Taskplan services.

It is developed to cover the needs of the EMR.

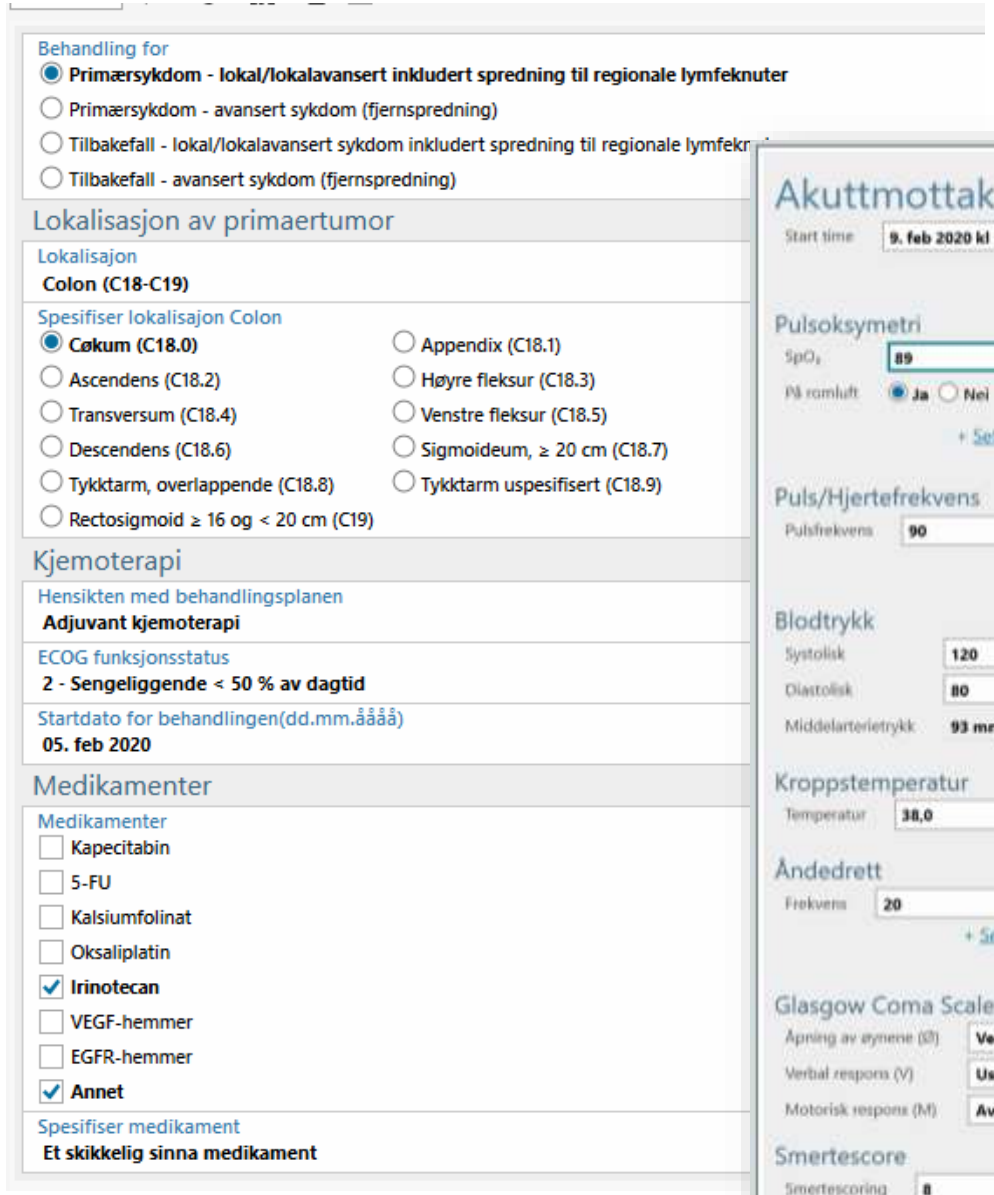


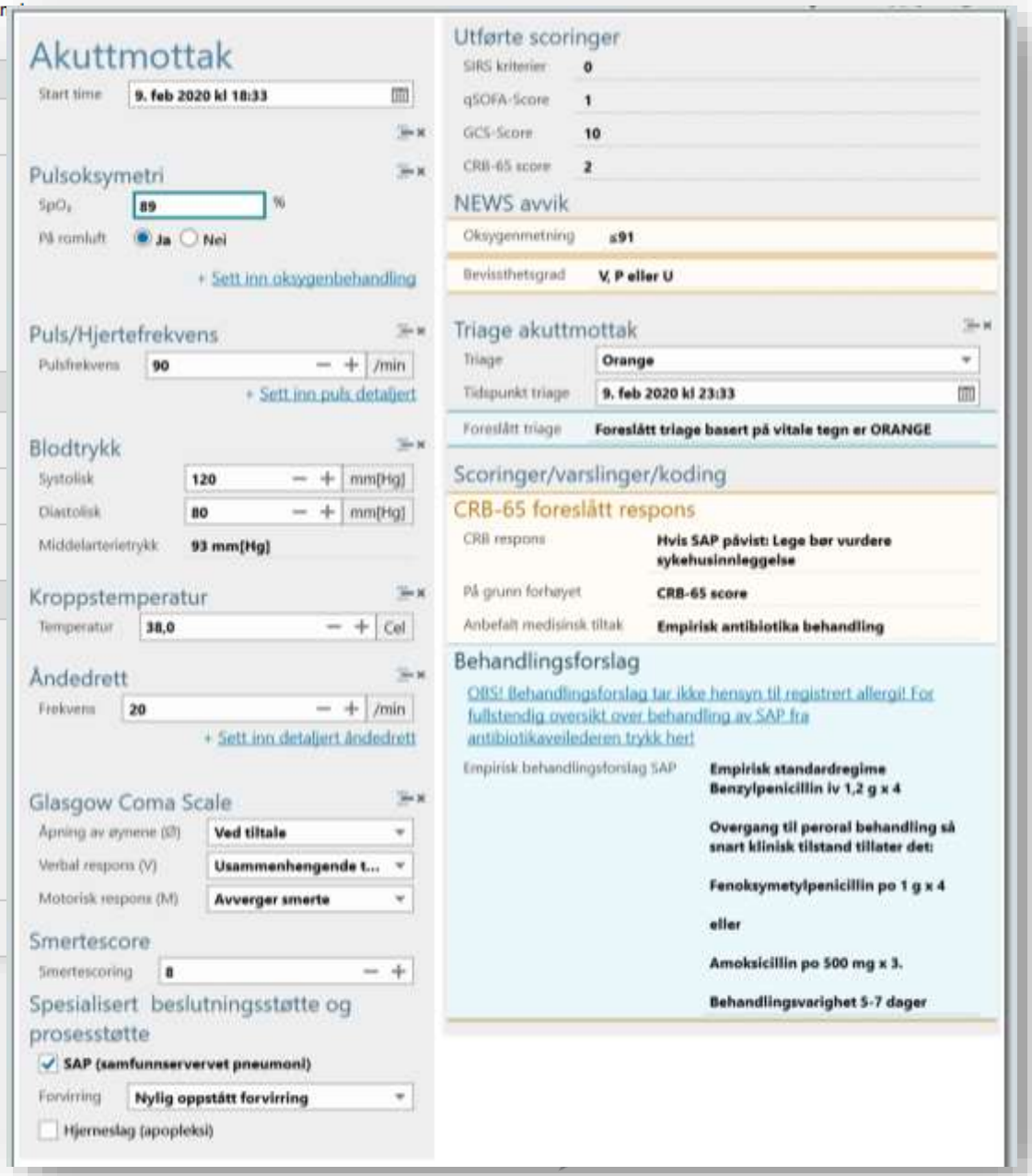
openEHR Forms is used within DIPS Arena to build clinical apps.

We have separate teams which use the tools on a daily basis.

Examples shown are:

- Reporting to national cancer registry
- Advanced admission note for the acute care

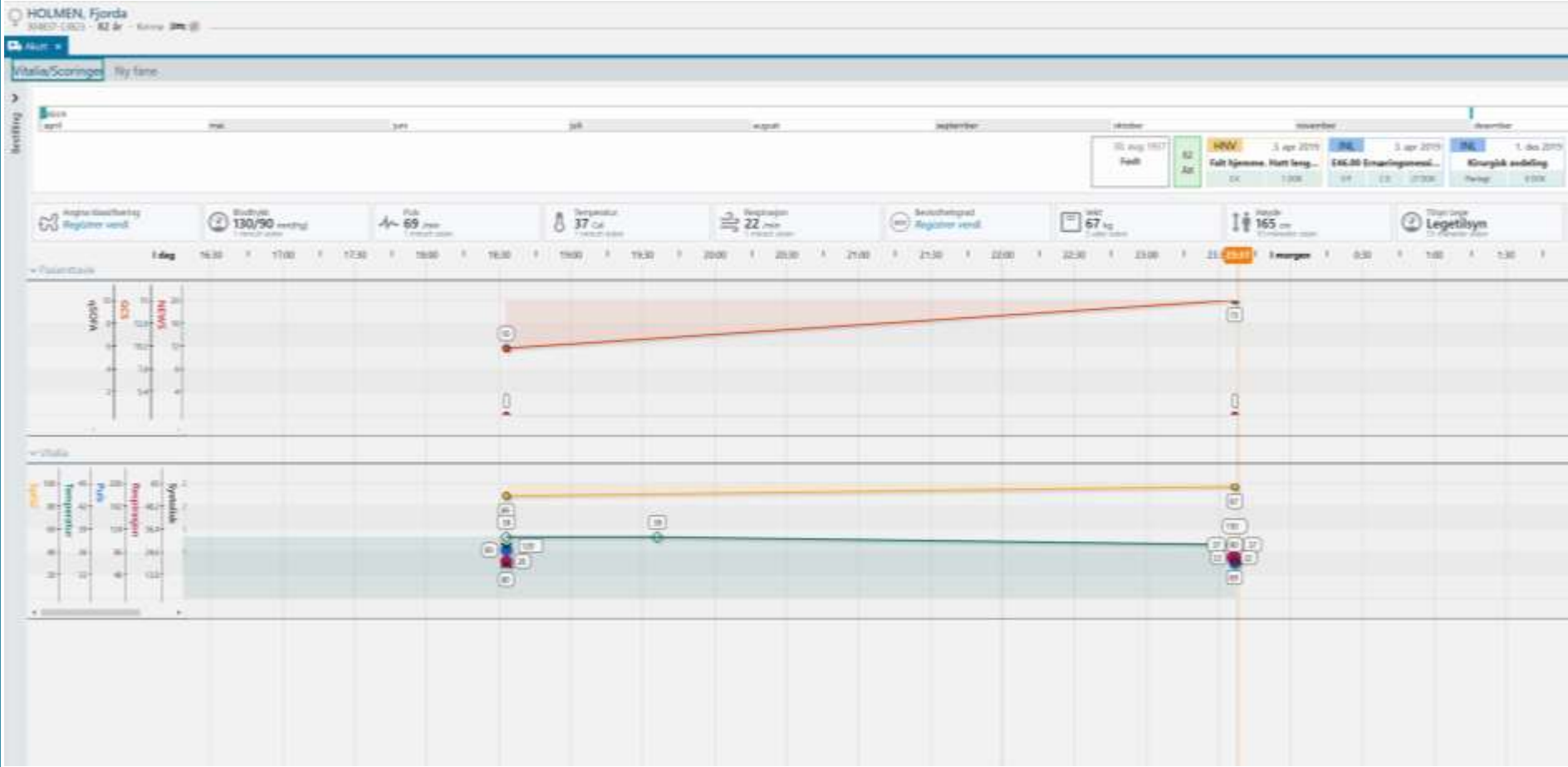




Store AQL queries defined as VAQM serves several purposes in DIPS Arena.

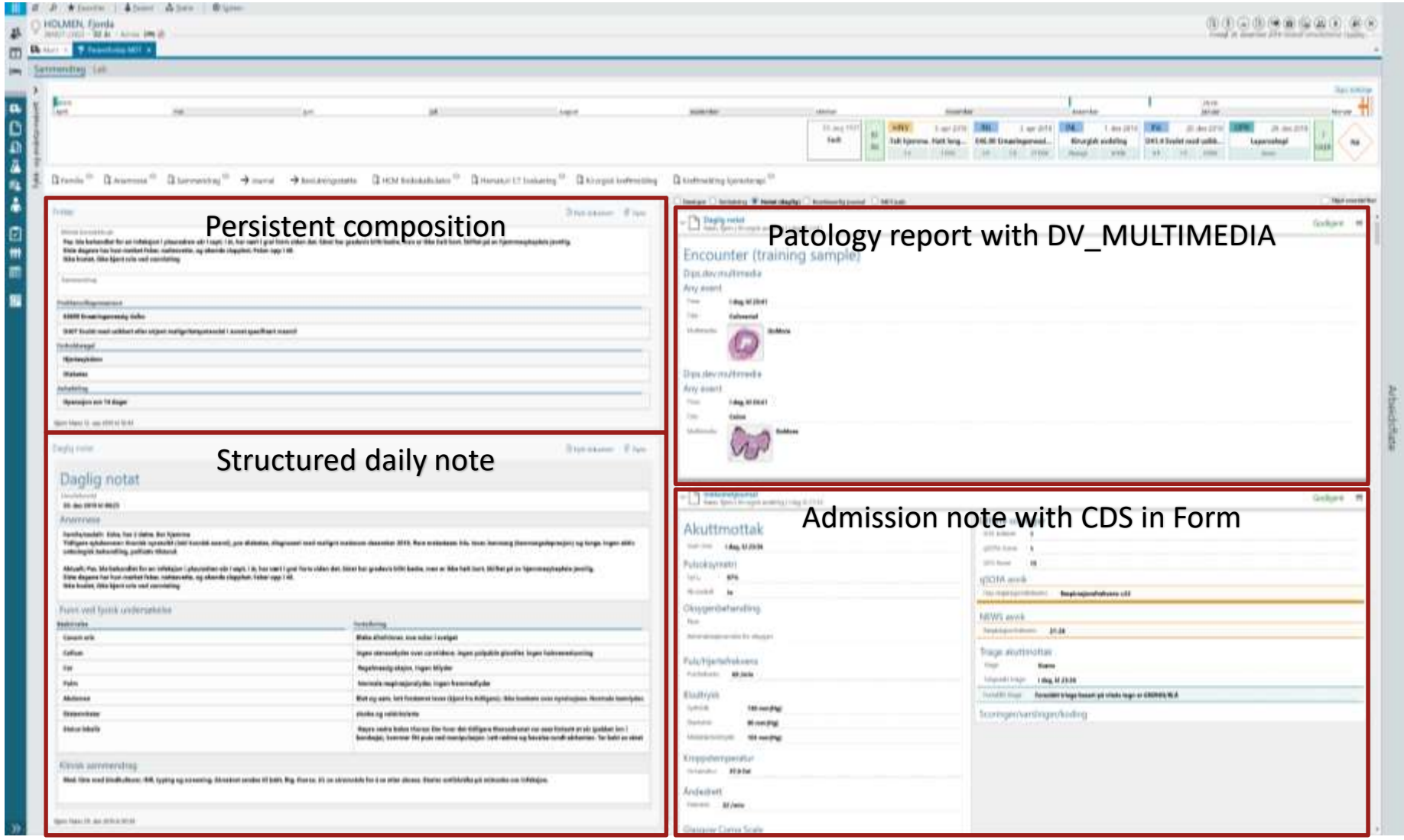
On the screen you see:

- Charts configured with 8 VAQM configurations
- Cards displaying key values for the ward, i.e. vital signs and encounter with doctor.



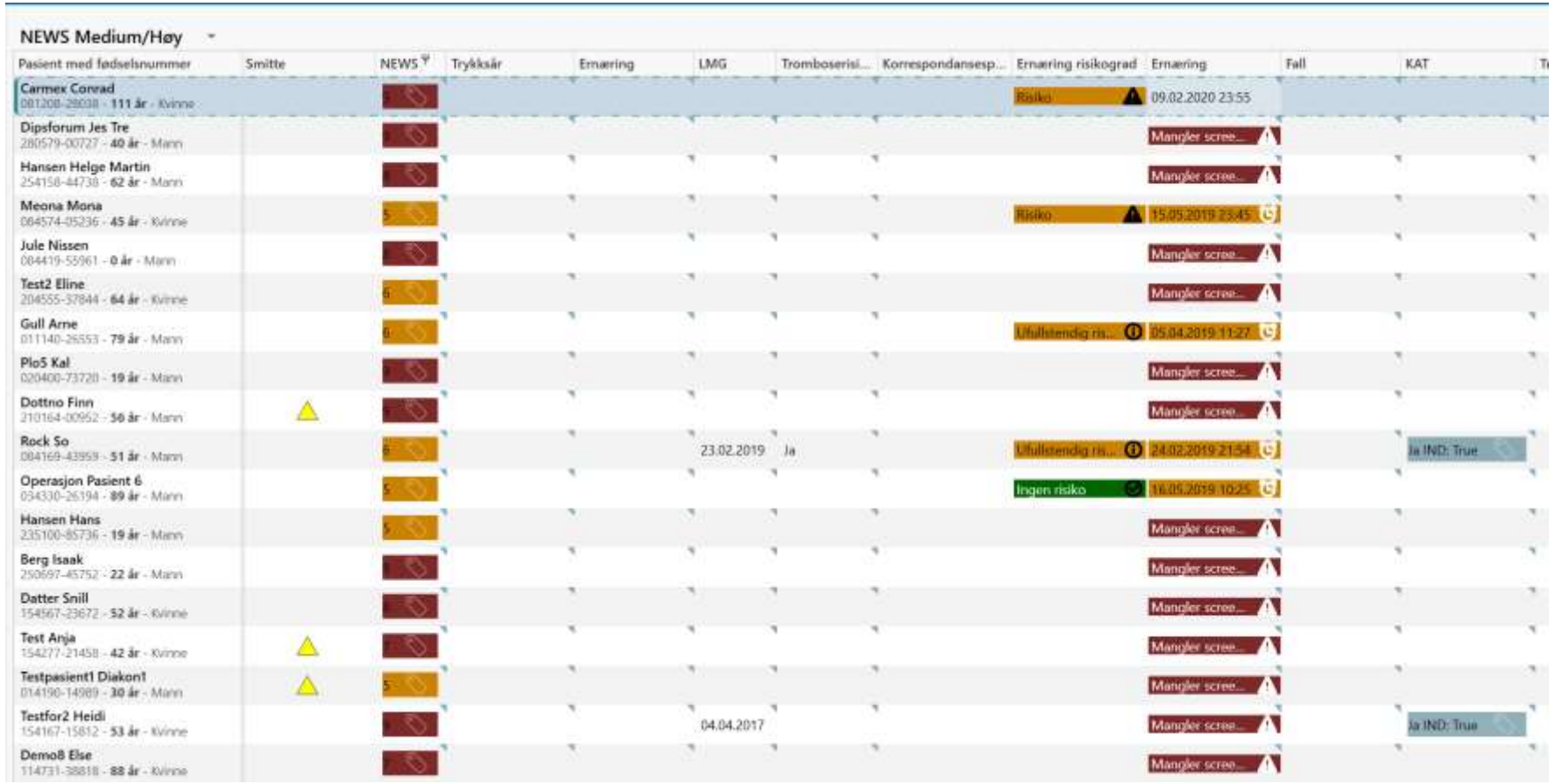
Widgets in Arena showing content from openEHR compositions.

This examples also shows the usage of DV_MULTIMEDIA for pathology images. The images is stored in the LAB system. The thumbnail and URI are stored in the composition.



Patient lists are used to follow up populations, i.e. Ward list, Admission lists, Trajectories.

openEHR data is queried using VAQM to give status of the patient.



EHR Craft – the openEHR platform

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Agenda

The purpose is demonstration of the tools DIPS use to build forms based applications in DIPS Arena.

The technical details related to deploy, run and maintain the openEHR CDR (EHR Store) is not covered.

EHR Store

- Web Studio
- REST API
- Definitions
- Status

Form Designer

- Introduction to the UI
- Some basic form design

EHR Craft Studio

- Introduction to the tool
- Some basic Form Testing

Form Advanced

- Calculations
- Reuse of data
- Script

Test Manager

- How to test use-cases
- Used to populate the given patient data

AQL

- Some examples

EHR Flow

- Taskplan viewer

VAQM

- What is it?
- Some examples

DIPS

pre-procurement-demo-dips

Traumatisk skada

Z042 Undersøkelse og observasjon etter arbeidsulykke

Datum / tid för skada

2020-01-23 11:34

Anatomisk plats

Vänster arm

+ Add anatomisk plats

Klinisk beskrivning

The patient held his hand in a door opening at work when a collegue accidentely slammed it.

+ Add multimediaresurs

NEWS

Time	**08. feb 2020 18:03**
Syremättnad	**>= 96**
Syrgastillförsel	**Nej**
Andningsfrekvens	**12-20**
Hjärtfrekvens	**51-90**
Totalpoäng (NEWS)	**0**

Låg | Låg/medium | Medium | Hög

Låg

Pulsoximetri

SpO_2

98 %

Mätplats

Enbart luft

(•) **Yes** ( ) No

Andning

Förekomst

Förekommer

Frekvens

19 /min

Enbart luft

[✓]

Puls/Hjärtfrekvens

Frekvens

72 /min

Regelbunden

(•) **Regelbunden** ( ) Oregelbunden

Kroppsställning

Sittande

Metod

Automatisk, icke-invasiv

Lokalisation

Finger **Coded text**

Start time **2020-02-08 18:03**

End time **2020-02-08 18:18**

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AQL

Terminology service is not embedded in EHR Store.

The client is expected to lookup terminologies in separate services.

The MATCHES syntax is supported and to search branches in i.e. SNOMED-CT the code_string values has to be expanded.

Example to the right.

```
SELECT
   c/uid/value AS CID,
   e/data[at0001]/items[at0012]/value AS Anatomy
FROM
   COMPOSITION c
      CONTAINS EVALUATION e[openEHR-EHR-EVALUATION.problem_diagnosis.v1]
WHERE
   e/data[at0001]/items[at0012]/value/defining_code/terminology_id/value = 'SNOMED-CT'
   AND e/data[at0001]/items[at0012]/value/defining_code/code_string matches {'80768000', '6921000
', '32153003', '62175007'}
LIMIT 10
```

Try it out

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AQL – given example

The AQL given to the demonstration is really interesting. Was it intended?

This AQL structure and underlying data will give the permutation problem which DIPS has described here:
https://github.com/DIPSAS/openehr-conformance/blob/master/aql/case1.1-permutation_bp/index.adoc

We are currently doing a rewrite of EHR Store Core. As part of this rewrite we will add functions to expand the AQL syntax to support new ways to express such queries.

```
select
   probl/data[at0001]/items[at0002]/value/value as diag,
   probl/data[at0001]/items[at0009]/value as descr,
   probl/data[at0001]/items[at0012]/value/value as loc,
   pulse/data[at0002]/events[at0003]/data[at0001]/items[at0004]/value/magnitud
e as puls,
   e/ehr_id/value
from EHR e
contains COMPOSITION a
contains (
   EVALUATION probl[openEHR-EHR-EVALUATION.problem_diagnosis.v1] or
   OBSERVATION pulse[openEHR-EHR-OBSERVATION.pulse.v2])
where pulse/data[at0002]/events[at0003]/data[at0001]/items[at0004]/value/mag
nitude > 80
offset 0 limit 100
```

Try it

https://github.com/DIPSAS/openehr-conformance/blob/master/aql/case1.1-permutation_bp/index.adoc

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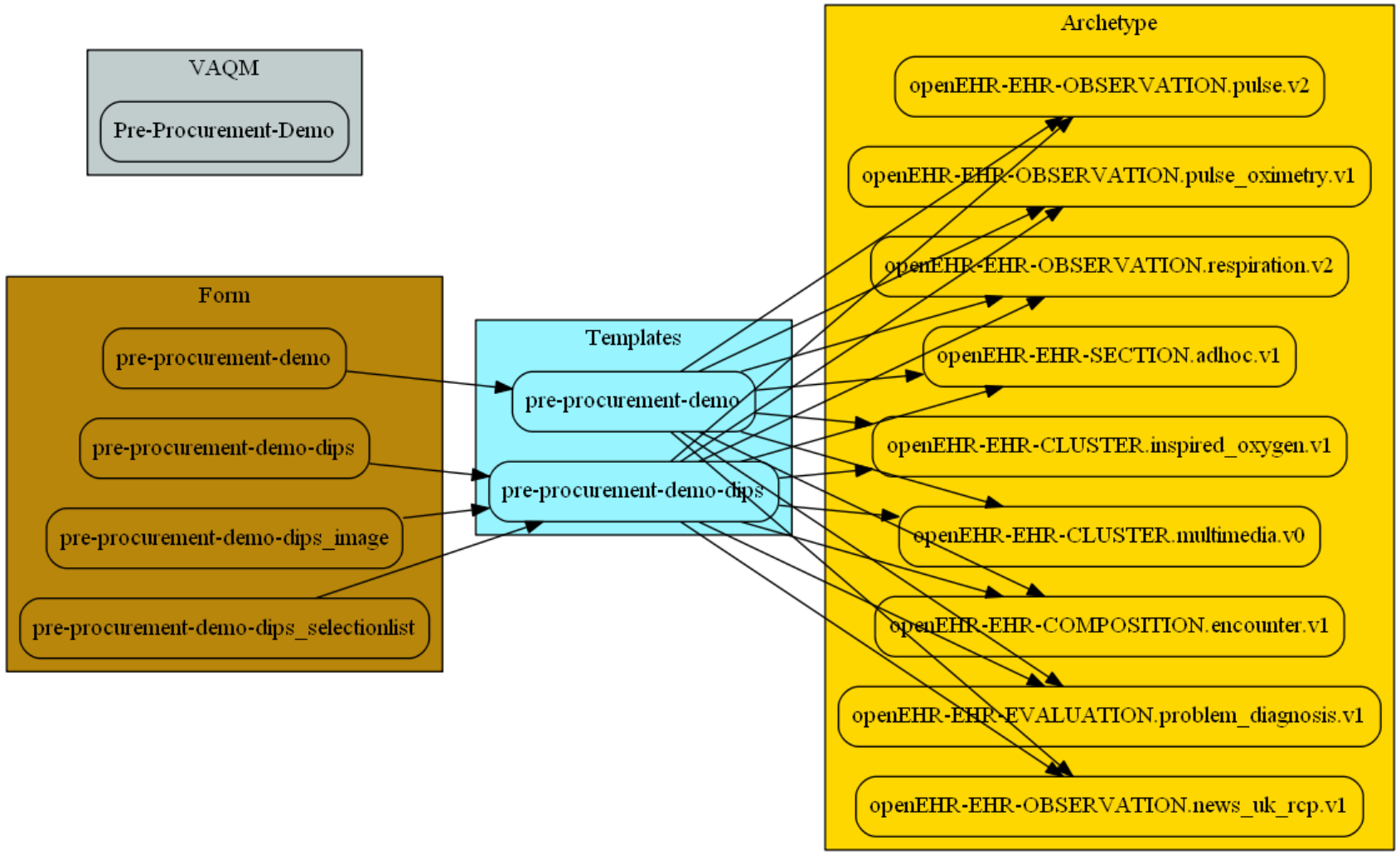
Package Manager

To manage resources with dependencies we have developed package manger. It's based on Nuget packages and the tool generated a dependency map.

It handles versions also for not versioned resources like Templates.

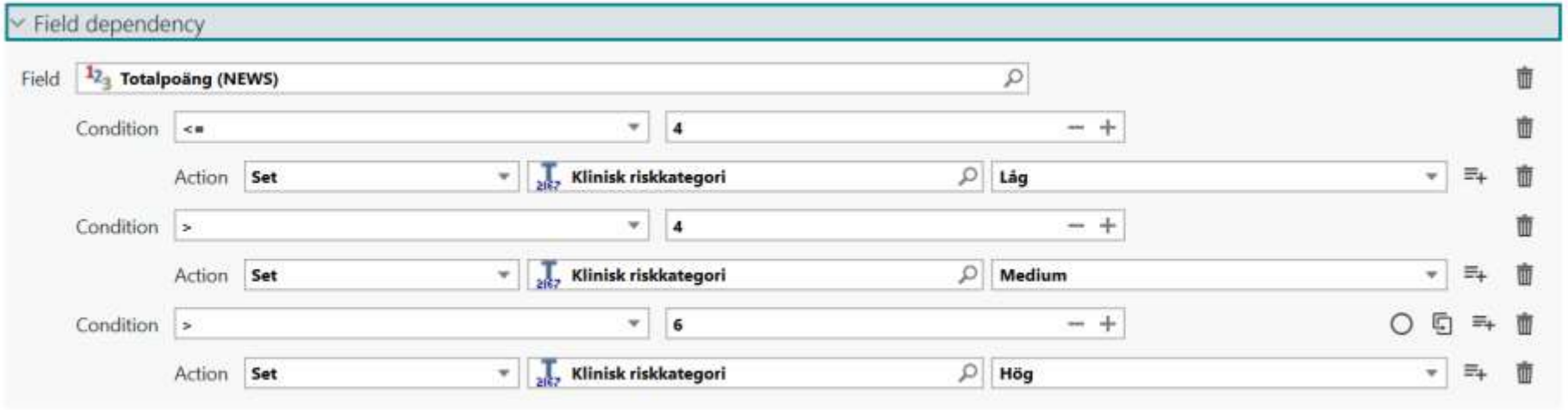


Form Dependencies

Form Designer has a visual editor to define dependencies between elements.

Screenshot shows an overview and one example.

Regelbunden	Equals	Oregelbunden
	Not equals	Oregelbunden
Totalpoäng (NEWS)	<=	4
	>	4
	>	6
Enbart luft	Is	True
	Is not	True
Enbart luft	Is	True
	Is not	True



Form Dependencies

Sometimes the visual dependency editor is not enough. Forms support JavaScript for more advance usage.

Screenshot shows how to add a listener on an form elements “OnChanged” event.

```
api.addListener(RESP_PRESENT, "OnChanged", function (id, value, parent) {
  console.log("Resp present: " + value);

  if (value) {
    var present = value;

    if (present && present.DefiningCode && present.DefiningCode.CodeString) {
      var atcode = present.DefiningCode.CodeString;

      switch (atcode) {
        case "at0063":
          // Is present
          newsController.updateRespirationPresent(true);
          break;

        case "at0064":
          // Is not present
          newsController.updateRespirationPresent(false);
          newsController.updateRespiration(getRespirationAsValue(api));
          break;

        default:
          newsController.updateRespirationPresent(false);
          newsController.updateRespiration(getRespirationAsValue(api));
          break;
      }
    }
  } else {
    console.log("|- RESP PRESENT is not set");
  }
});
```

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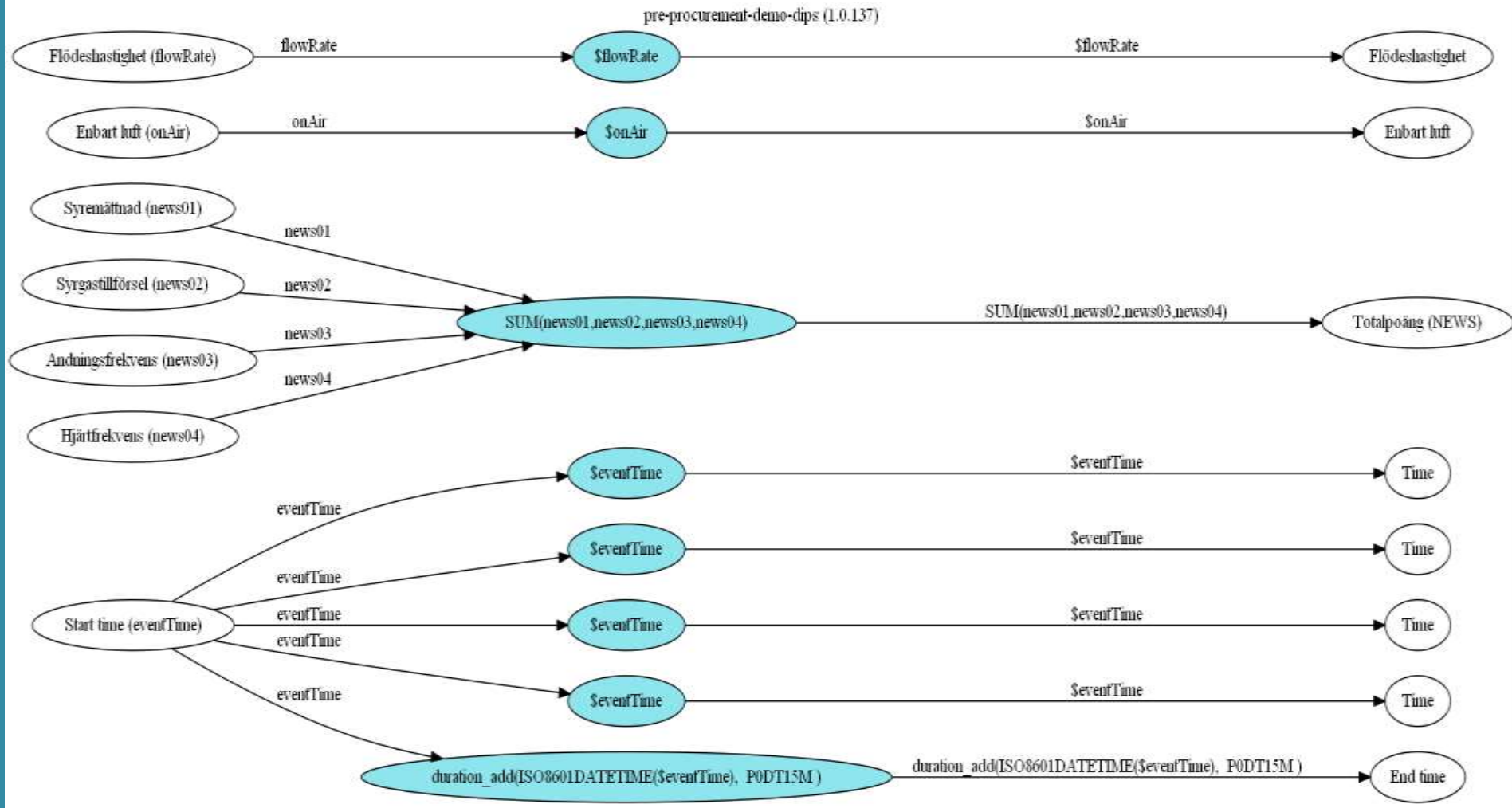
Form Dependencies

EHR Craft Studio has an embedded visualizer. Its purpose is to make the flow in the form easier to read.

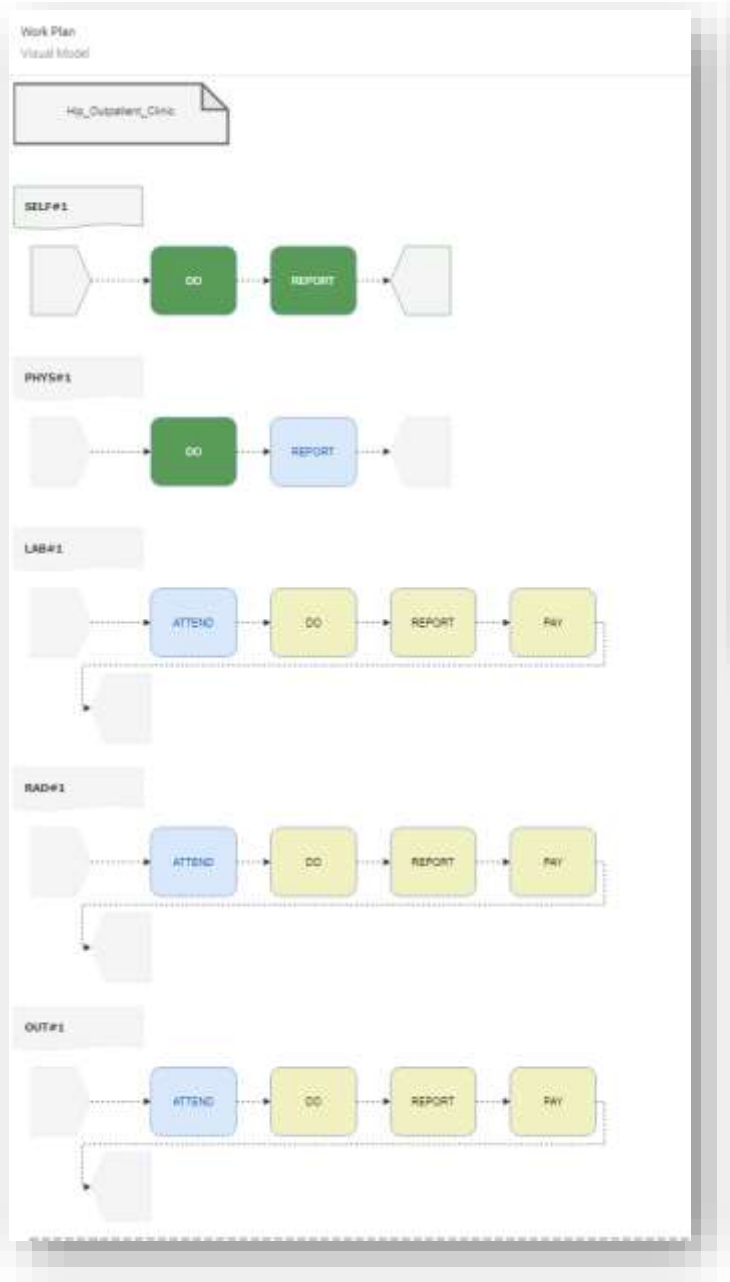


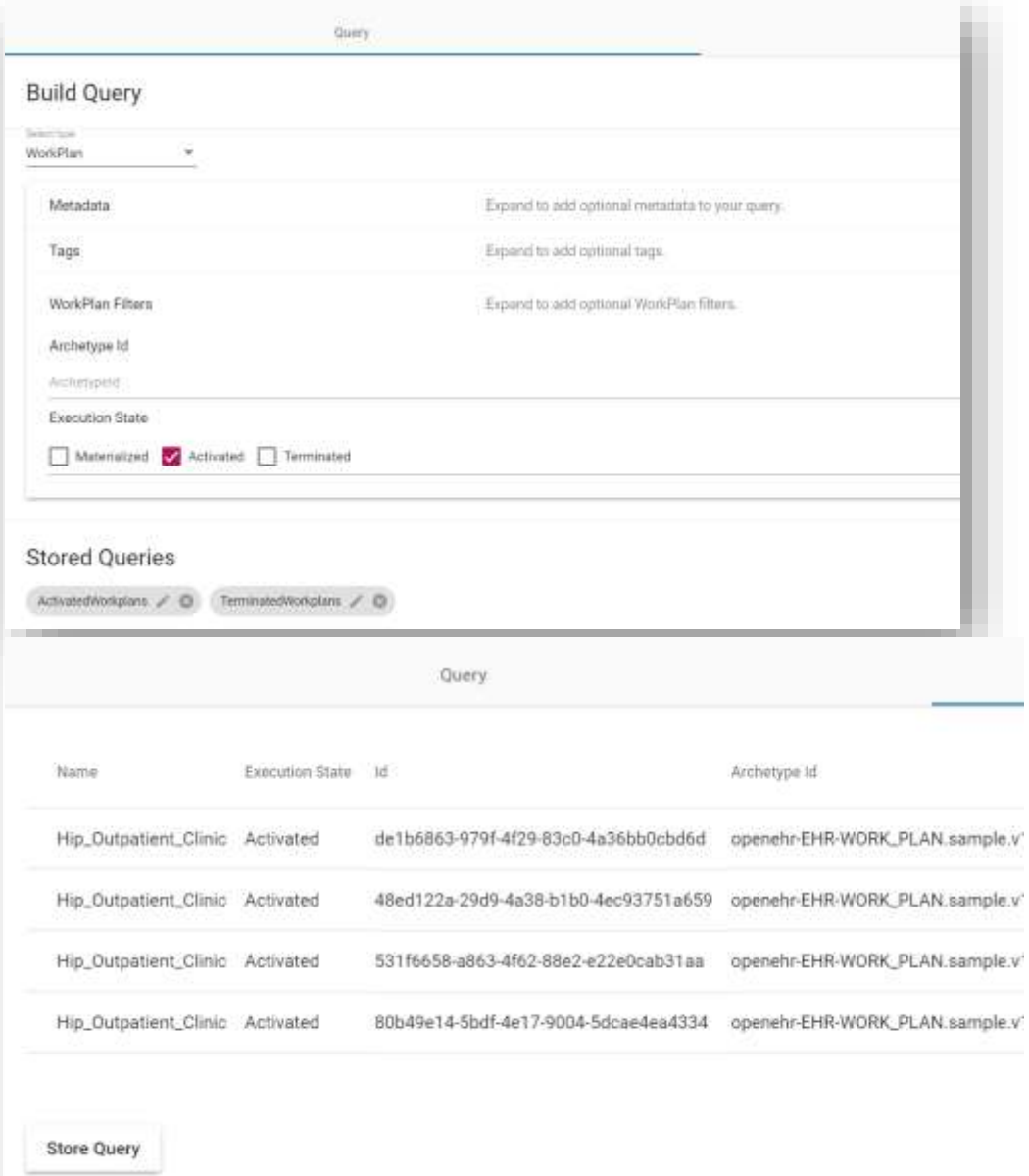
EHR Flow

openEHR Taskplan engine. Targeting release candidate Q4 2020.

DIPS involved in specification work and has provided some TP examples to illustrate the use-cases for Taskplanning.

Screenshot is from one of the examples: HIP Outpatient Clinic





https://github.com/openEHR/TP-examples

DIPS

EHR Craft Suite

The vision:

enable efficient healthcare by making structured data accessible.

The solution:

EHR Craft Suite as a platform with services and tools.

A suite which give developers tools, components and services to develop functionality fast, consistent and standardized.

Based on an open standard for reuse of clinical content.

EHR Craft Suite

Overview of the functional components.

- EHR Store is the openEHR CDR
- Form Designer is used to design forms
- EHR Craft Studio is an “IDE” like tool for openEHR assets