HL7-HK 1st Connectathon – Topic Briefing

13 NOV 2023

Agenda

- What is “Connectathon”?
- Topics to be discussed
  - Quick guide for Encounter record sharing
  - Medication data download (FHIR)
  - GOPC PPP data download (FHIR)
- Challenges

What is “Connectathon”?

Connectathon has two very important purposes and one very important principle. A Connectathon is an event that is centered on an open consensus built Interoperability (Connection) specification. The purpose of a Connectathon is both to prove that the specification is complete as well as to prove that implementations written to that specification can ‘connect’. The most important principle of a Connectathon is that it is a safe place for failure in these endeavors. That is that it is free of negative consequences of a mistake in someone’s implementation and that the specification might need to be refined.

Source: https://healthcaresecprivacy.blogspot.com/2013/11/what-is-connectathon.html

Our Purpose

EHR

- Consent HL7 interface specification for EHR
- Speed up private data sharing

HL7 HK

- Form a community on HL7 & FHIR in HK to develop healthcare interface standards

Quick guide for Encounter record sharing

Specifications of eHR data sharing

Materials to support interface development for eHR data upload

- eHealth web site
  - eHR Contents Guide Book
    - https://www.ehealth.gov.hk/filemanager/content/pdf/en/ehris/ehr-content-standards-guidebook.pdf
  - eHR Contents and Codex
    - https://www.ehealth.gov.hk/en/healthcare-provider-and-professional/resources/information-standards/information-standard-document.html#appendices

- Technical Specifications, e.g. Encounter Data Domain
  - Data Requirement Specification for eHR Encounter Record v1.4.3.pdf *(73 pages)*
  - BLS Technical Interface Specification for eHR Encounter Record v1.4.4.pdf *(156 pages)*
    - LAAM_Interface_Specification_SOAP_v2.0.19_202309251007_draft2.docx *(297 pages)*
  - Test case: eHRSS_Encounter DCT (Dec 2021 version).xlsx

Introduction of “Quick Guide”

- Merge and simplify Data Requirements, BLS and LAAM Technical Specifications
  - into one “Quick Guide” to aid understanding of technical requirements
    - e.g. Encounter Record *(42 pages)*

- Step-by-step to guide the developer to construct the interface message
  - Include self testing document
    - With test case scenario, sample data and messages to illustrate

2	**Test Case ID**	**ENCTR-002 [Outpatient]**
	Function Description	There are subsequent changes in HCRs' clinical records in Batch 1 data upload. HCP uploads increment changes to eHRSS by INC Mode.
	Subsequent case of	ENCTR-001
	Testing Assumption	• HCP has already verified Batch 1 data are comp
	Test Actions	HCP updates below encounter records in eMR systen
	2a	<HCR2> requested to cancel the appointment by of the existing record in the eMR system. e.g. Visit date time = '20-Oct-2023 09:10' Visit clinic identifier = 9907819043 Visit clinic long name = 'Clinic A' Visit clinic local name = 'Clinic A' Visit attendance indicator = 'C' Encounter type = 'O' ***Notes:*** *If 'Visit attendance indicator' is not applicable in your eMR system, HCP may use 'Delete' transaction to remove the unexpected appointment record.*
	2b	<HCR3> marked attendance by updating the attendance status of existing

```
280620114506|ENCTR_MOCK_DEV_005|2023-09-01 09:00:00.000|I|2023-09-0
OP|||9907819043|9907819043|O|||1|||||||||||||||||||||1|9907819043|Cl
10-20 10:00:00.000||FM|FM remark|N|||||||||||||||||||||||||||||\CR\
165913031309|ENCTR_MOCK_DEV_006|2023-09-01 09:00:00.000|I|2023-09-0
OP|||9907819043|9907819043|O|||1|||||||||||||||||||1|9907819043|Clinic A|Clinic A|202
10:15:00.000||ENT|ENT remark|N|||||||||||||||||||||||||\CR\
```

```
<!-- Begin HL7 message -->

<?xml version="1.0" encoding="UTF-8"?>
<ORU_R01 xsi:schemaLocation="urn:hl7-org:v2xml ORU_R01.xsd"
xmlns="urn:hl7-org:v2xml" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance">
  <MSH>
      <MSH.1>|</MSH.1>
      <MSH.2>^~\&amp;</MSH.2>
      <MSH.3>
            <HD.1>[HCP system name and version]</HD.1>
      </MSH.3>
      <MSH.4>
            <HD.1>[HCP ID]</HD.1>
      </MSH.4>
      <MSH.5>
            <HD.1>EIF</HD.1>
      </MSH.5>
      <MSH.6>
            <HD.1>eHR</HD.1>
      </MSH.6>
      <MSH.7>
            <TS.1>[Message generation datetime]</TS.1>
      </MSH.7>
```

Objective of the Quick Guide

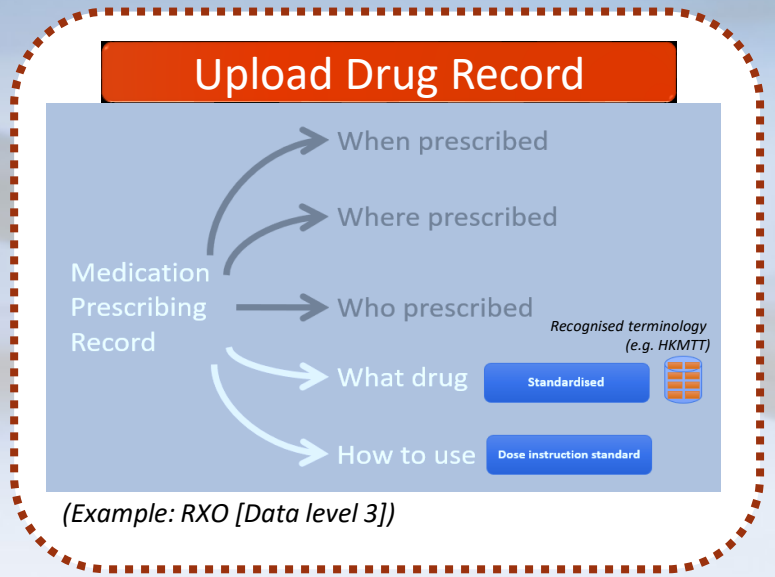
- Support HCP to share records in quick manner

- Most common scenarios and data elements will be included in the quick guide
  - e.g. Encounter - Outpatient scenario

- Not intend to replace the “full” specifications

Medication data download

Data Flow for Drug (Prescribing - RXO & Dispensing- RXD) sharing



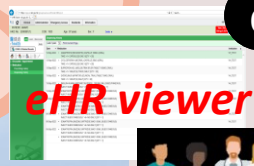
(Example: RXO [Data level 3])

醫健通 ehealth 青衣特別行政區政府 HKSARGOVT

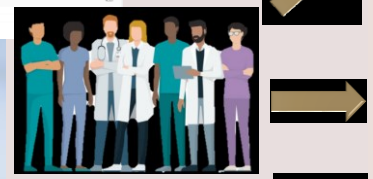
RXD

RXO

d



Health Care Professional



Notification received

Patient Consent

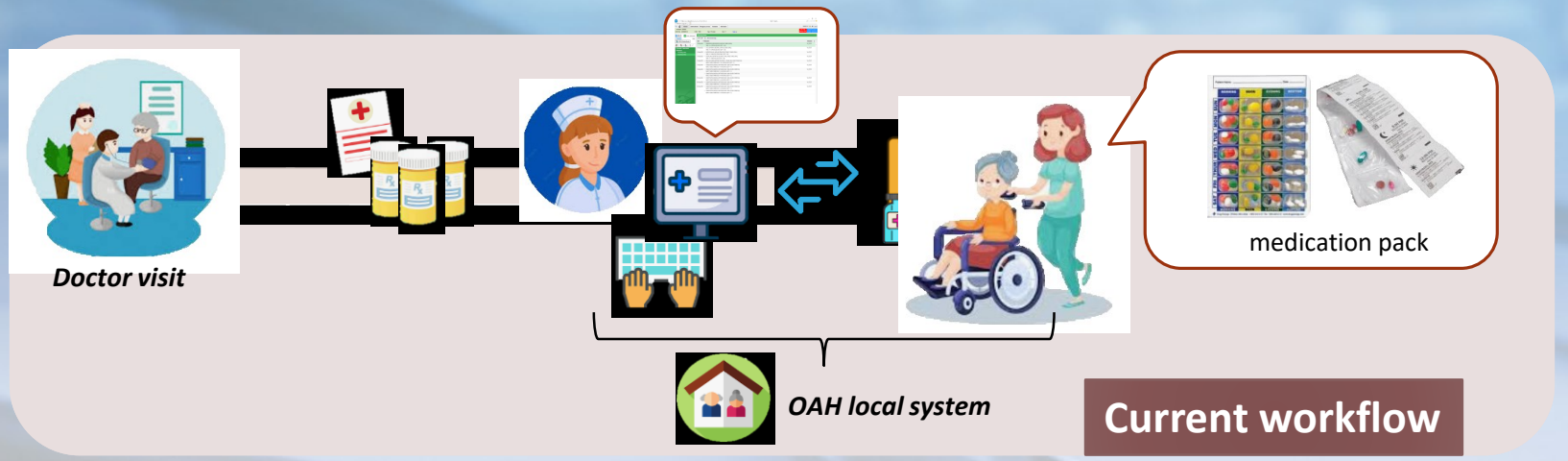
HCPs

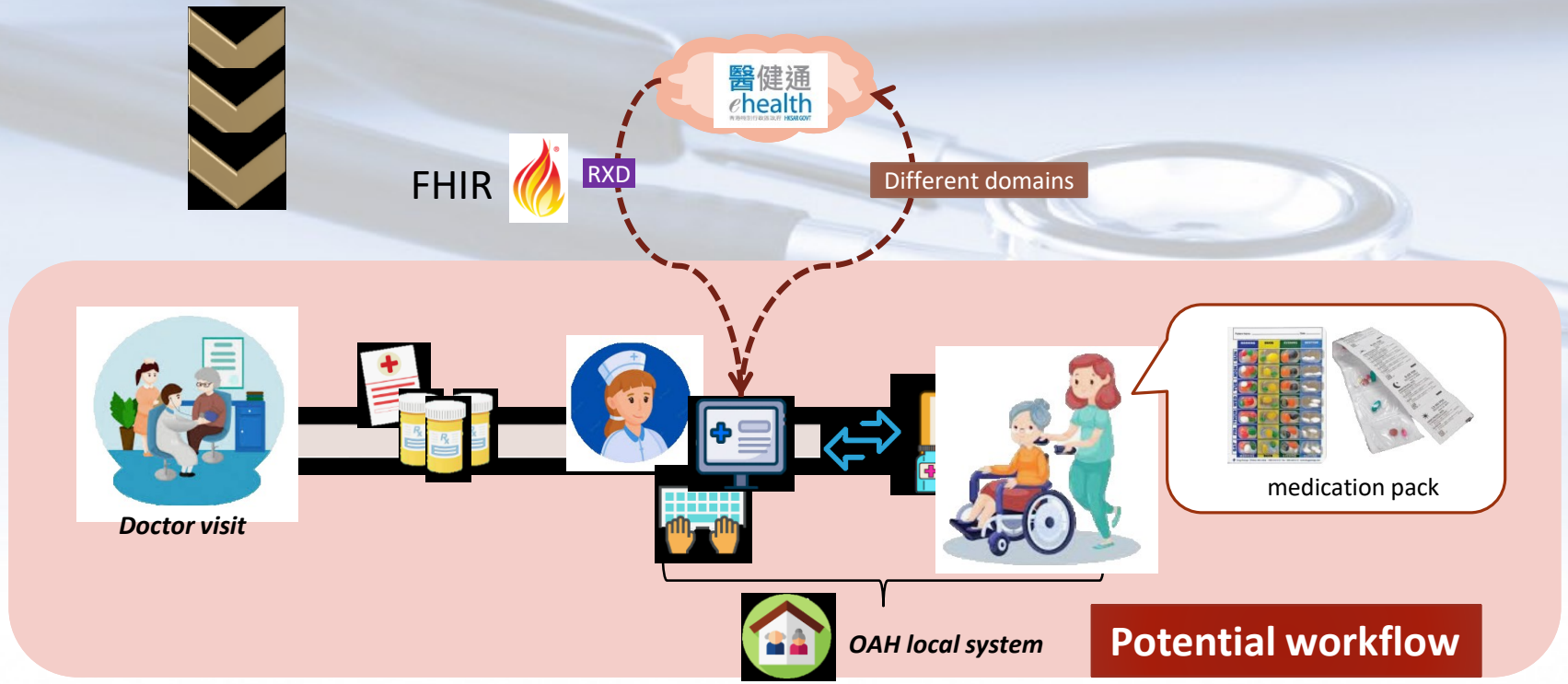
a ***Data Level***

b ***HKMTT***

c ***Dataset***

Medication Data Download (Use case)





- Reduce manual input
- Provide a more complete medication profile

FHIR

Fast Healthcare Interoperability Resources

- Next generation standards framework created by HL7

HL7 FHIR

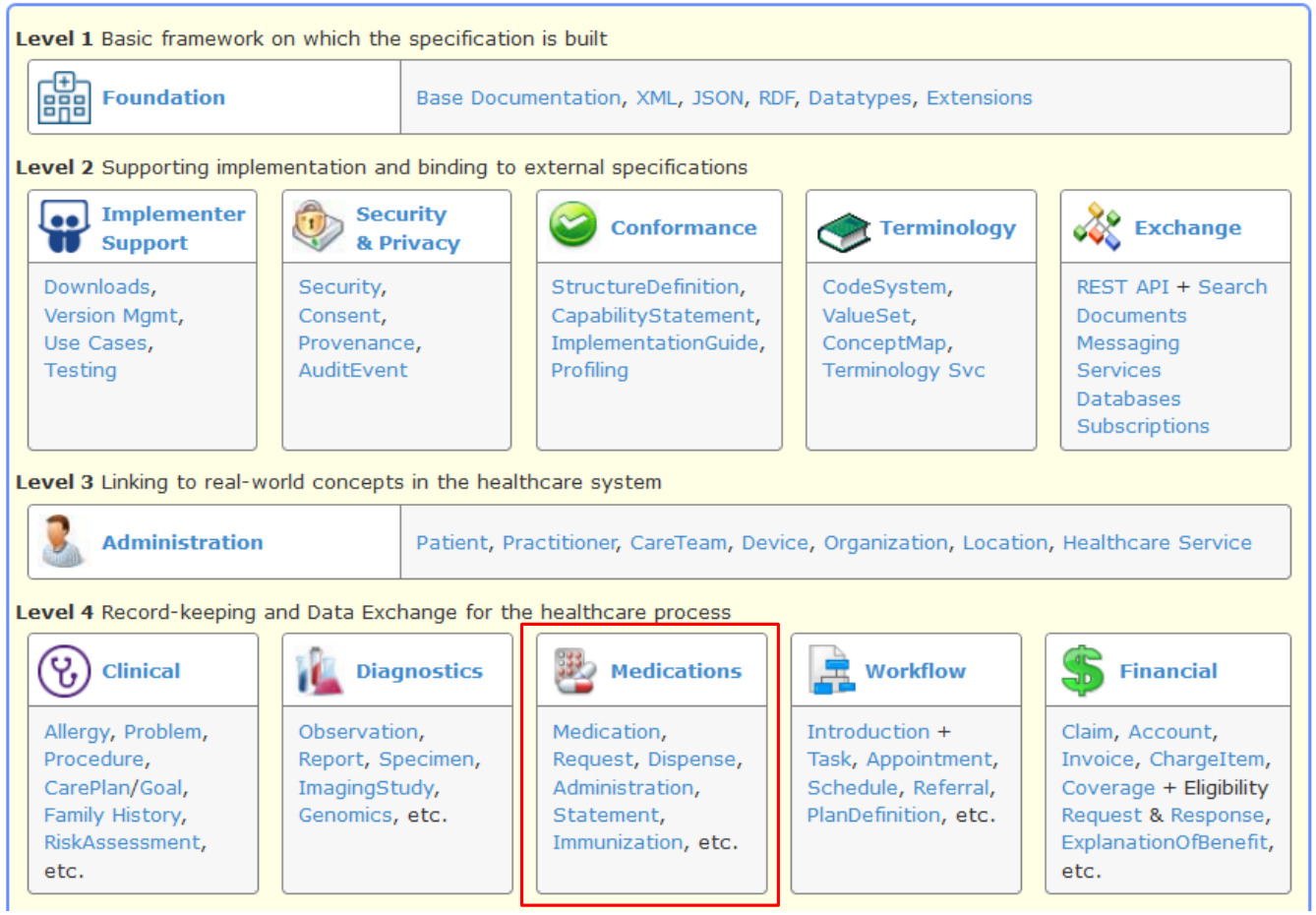
What's FHIR feature?

- Global standard with complete **self-extension** capability

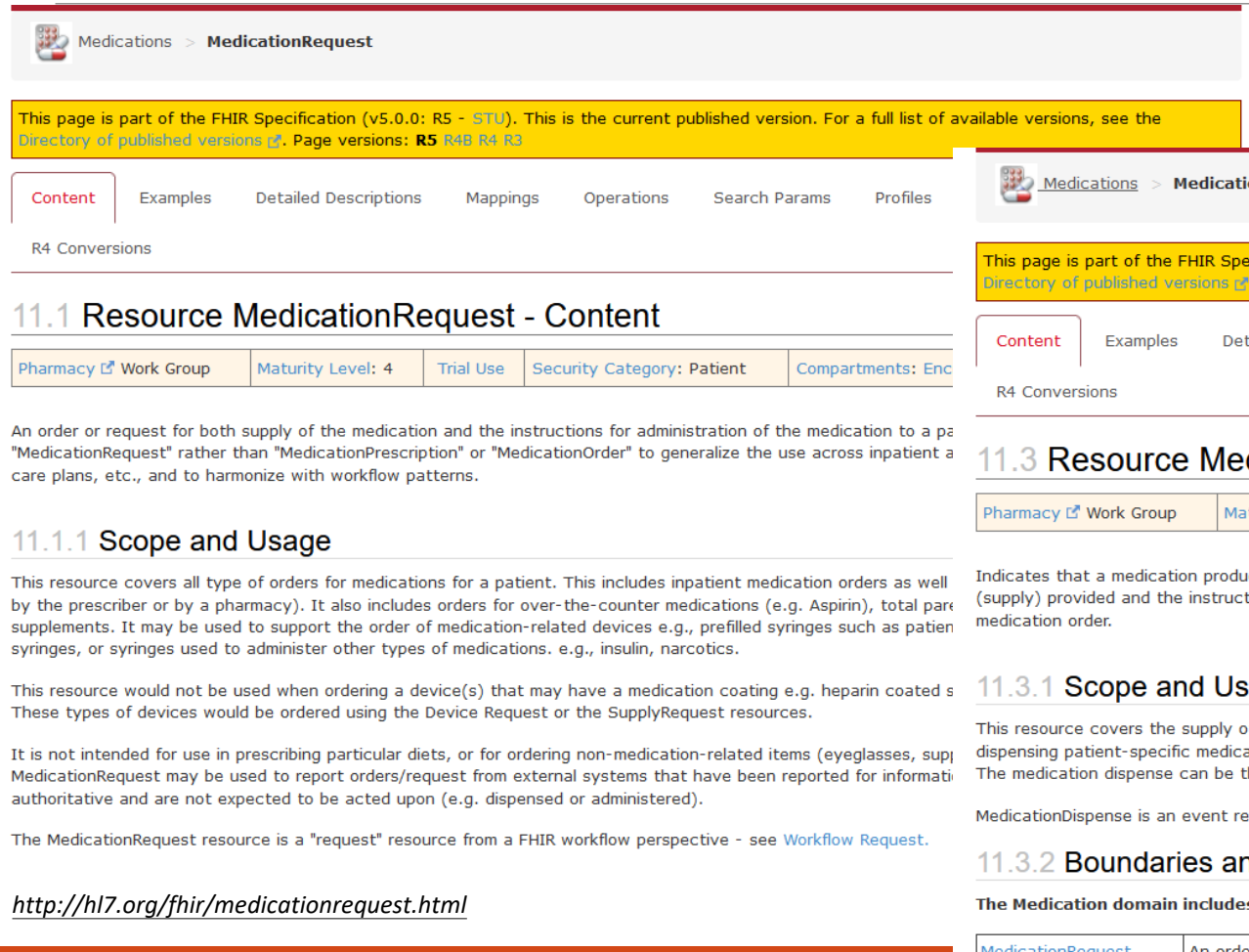
- Message **readability** between clinical interface specialist and health informatician
  - Support to add human-readable narrative in the machine-readable message

- Modern web-based suite of **API** technology
  - Small-sized message : JSON / RESTful protocol
  - Efficient information exchange between systems and tablets/cell phones
  - Meet the most common IT skillset

FHIR Resources



FHIR Resources – MedicationRequest and MedicationDispense



Medications > **MedicationRequest**

This page is part of the FHIR Specification (v5.0.0: R5 - STU). This is the current published version. For a full list of available versions, see the Directory of published versions. Page versions: **R5** R4B R4 R3

Content | Examples | Detailed Descriptions | Mappings | Operations | Search Params | Profiles | R4 Conversions

11.1 Resource MedicationRequest - Content

Pharmacy Work Group	Maturity Level: 4	Trial Use	Security Category: Patient	Compartments: Enc

An order or request for both supply of the medication and the instructions for administration of the medication to a pa "MedicationRequest" rather than "MedicationPrescription" or "MedicationOrder" to generalize the use across inpatient a care plans, etc., and to harmonize with workflow patterns.

11.1.1 Scope and Usage

This resource covers all type of orders for medications for a patient. This includes inpatient medication orders as well by the prescriber or by a pharmacy). It also includes orders for over-the-counter medications (e.g. Aspirin), total pare supplements. It may be used to support the order of medication-related devices e.g., prefilled syringes such as patien syringes, or syringes used to administer other types of medications. e.g., insulin, narcotics.

This resource would not be used when ordering a device(s) that may have a medication coating e.g. heparin coated s These types of devices would be ordered using the Device Request or the SupplyRequest resources.

It is not intended for use in prescribing particular diets, or for ordering non-medication-related items (eyeglasses, supp MedicationRequest may be used to report orders/request from external systems that have been reported for informati authoritative and are not expected to be acted upon (e.g. dispensed or administered).

The MedicationRequest resource is a "request" resource from a FHIR workflow perspective - see Workflow Request.

http://hl7.org/fhir/medicationrequest.html

http://hl7.org/fhir/medicationdispense.html

Medications > **MedicationDispense**

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11.3 Resource MedicationDispense - Content

Pharmacy Work Group	Maturity Level: 2	Trial Use	Security Category: Patient	Compartments: Encounter, Patient, Practitioner

Indicates that a medication product is to be or has been dispensed for a named person/patient. This includes a description of the medication product (supply) provided and the instructions for administering the medication. The medication dispense is the result of a pharmacy system responding to a medication order.

11.3.1 Scope and Usage

This resource covers the supply of medications to a patient. Examples include dispensing and pick-up from an outpatient or community pharmacy, dispensing patient-specific medications from inpatient pharmacy to ward, as well as issuing a single dose from ward stock to a patient for consumption. The medication dispense can be the result of a pharmacy system responding to a medication order.

MedicationDispense is an event resource from a FHIR workflow perspective - see Workflow Event

11.3.2 Boundaries and Relationships

The Medication domain includes a number of related resources

MedicationRequest	An order for both supply of the medication and the instructions for administration of the medicine to a patient.
MedicationDispense	Provision of a supply of a medication with the intention that it is subsequently consumed by a patient (usually in response to a

Examples


```
"identifier":[
   {
      "value":"MOEVH 2300043531"
   }
],
"status":"completed",
"intent":"order",
"medicationCodeableConcept":{
   "coding":[
      {
         "system":"https://ehealth.gov.hk/hkmtt/",
         "code":"6080485",
         "display":"sodium chloride 0.9 % topical irrigation solution (1 L)"
      },
      {
         "system":"local",
         "code":"SODI78",
         "display":"SODIUM CHLORIDE 0.9% 1L (IRRIGATION)"
      }
   ]
},
"subject":{
   "reference":"Patient/584039800354"
},
"authoredOn":"2023-04-18T16:11:55+08:00",
"requester":{
   "reference":"PractitionerRole/147e8f4aa0740b35c3fb89bf6361745a"
},
"note":[
   {
      "text":"[Dispense by Pharmacy]"
   }
],
"dosageInstruction":[
   {
      "sequence":0,
      "text":"SODIUM CHLORIDE 0.9% irrigation solution 1l\nirrigation :  10 ml daily [both nostrils] for 8 weeks",
      "asNeededBoolean":false,
      "site":{
         "coding":[
```

```
{
    "resource":{
       "resourceType":"MedicationDispense",
       "extension":[
          {
             "url":"1003855-PrescribionOrderNumber",
             "valueString":"230004353"
          },
          {
             "url":"1003858-DrugSequenceNumber",
             "valueInteger":1
          }
       ],
       "status":"completed",
       "medicationCodeableConcept":{
          "coding":[
             {
                "system":"https://ehealth.gov.hk/hkmtt/"
             },
             {
                "system":"local",
                "code":"SODI78",
                "display":"SODIUM CHLORIDE 0.9% NASAL DOUCHE 1L (INTRANASAL)"
             }
          ]
       },
       "subject":{
           "reference": "Patient/e39606f9-4fa6-4543-9c12-473be9234613"
       },
       "performer":[
```

Data Level For Drug Record (RXO & RXD)

a

Level 2

- **Local drug without HKCTT mapping**
- **Dose instruction in sentence**

Level 3.1

- **Local drug with HKCTT mapping**
- **Dose instruction in sentence**

missing mandatory regimen fields; regimens without HKCTT mapping

Level 3.2 *(Sept 2021)*

- **Local drug with HKCTT mapping**
- **Dose instruction in sentence**

mandatory regimen fields with HKCTT mapping provided - frequency, route, duration

Dispensing datetime	6/12/2010
Dispensing institution identifier	PMH
Dispensing institution long name	Princess Margaret Hospital
Dispensing institution local name	Princess Margaret Hospital
Prescription order number	MOETMH123456700
Prescriber's English full name	Dr Chan Tai Man
Prescriber's Chinese full name	陳大文醫生
Dispensed drug - recognised terminology name	
Dispensed drug identifier - recognised terminology	
Dispensed drug description - recognised terminology	
Dispensed drug code - local terminology	PARA01
Dispensed drug description - local terminology	PARACETAMOL TABLET 500MG
Dose instruction	Take 2 tablets daily when required
Special instruction	omit if vomiting or diarrhoea

Local drug details

Dose instruction in sentence

Mapping with HKCTT

Drug

6/12/2010
PMH
Princess Margaret Hospital
Princess Margaret Hospital
MOETMH123456700
Dr Chan Tai Man
陳大文醫生
HKCTT
6027457
Panadol (paracetamol) oral tablet 500 mg (HK-02280)
PARA01
PARACETAMOL TABLET 500MG
Take 2 tablets daily when required
omit if vomiting or diarrhoea

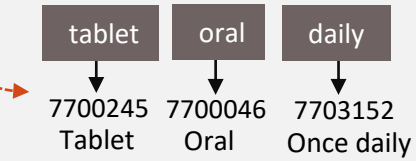
Mapping with HKCTT

Drug

6/12/2010
PMH
Princess Margaret Hospital
Princess Margaret Hospital
MOETMH123456700
Dr Chan Tai Man
陳大文醫生
HKCTT
6027457
Panadol (paracetamol) oral tablet 500 mg (HK-02280)
PARA01
PARACETAMOL TABLET 500MG
Take 2 tablets daily when required
omit if vomiting or diarrhoea

Regimen

- ***Dose unit***
- ***Freq***
- ***Supp. Freq.***
- ***Route***
- ***Site***
- ***Duration unit***
- ***Quantity unit***



Dataset for Drug Record

C

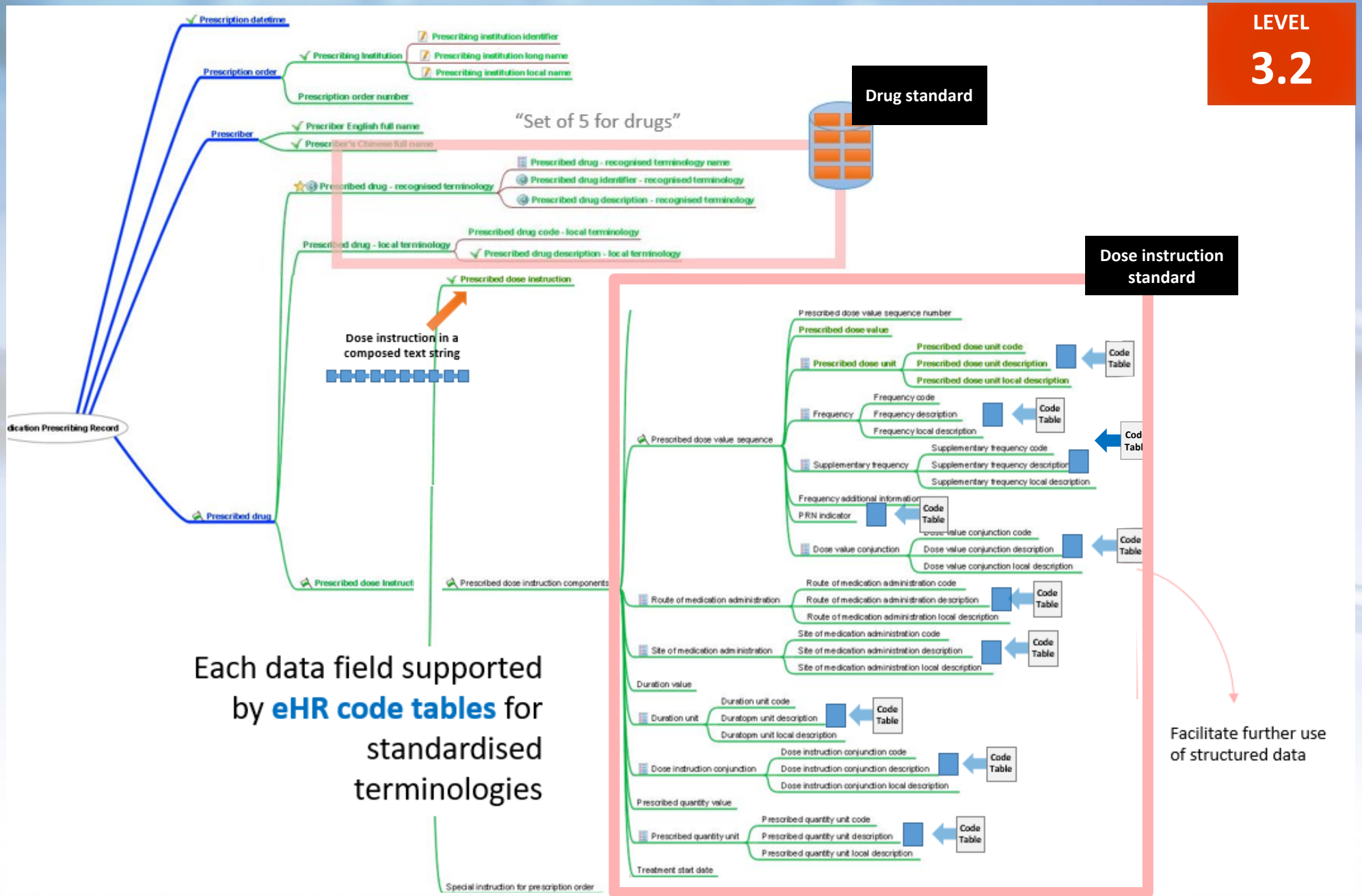
When prescribed

Where prescribed

Who prescribed

What drug

How to use



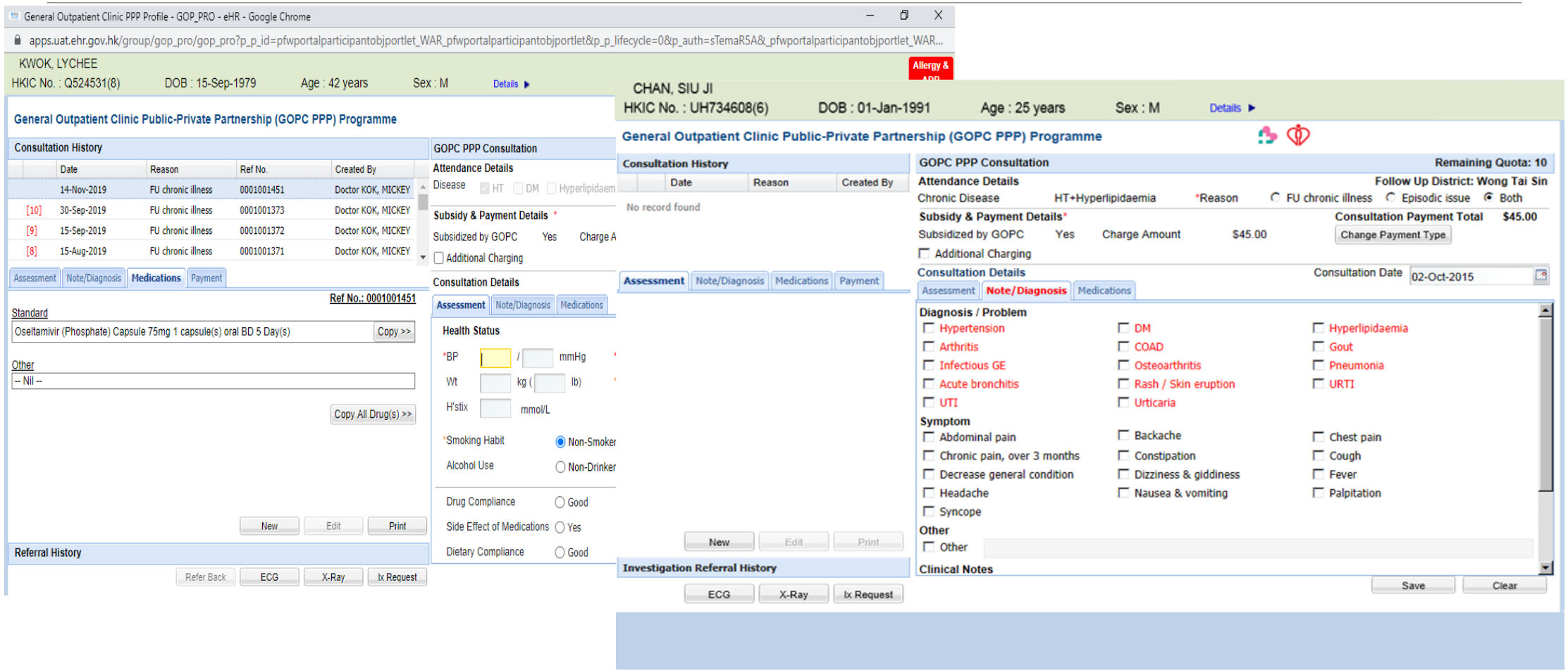
GOPC PPP data download

Background

- Private doctors express their concerns of duplicate input of clinical record between PPP System and clinic local Electronic Medical System

- Provide Data Synchronization Interface to other clinical local Electronic Medical Systems

GOPC PPP Data input



FHIR Resources – Questionnaire and QuestionnaireResponse

Content | Examples | Detailed Descriptions | Mappings | Profiles & Extensions | R3 Conversions

2.37 Resource Questionnaire - Content

FHIR Infrastructure Work Group	Maturity Level: 3	Trial Use	Security Category: Business	Compartments: Not linked to any defined compartments

A structured set of questions intended to guide the collection of answers from end-users. Questionnaires provide detailed control over order, presentation, phraseology and grouping to allow coherent, consistent data collection.

2.37.1 Scope and Usage

A **Questionnaire** is an organized collection of questions intended to solicit information from patients, pro simple flat lists of questions or can be hierarchically organized in groups and sub-groups, each containing they are ordered and grouped, any intervening instructional text and what the constraints are on the allo the QuestionnaireResponse resource.

Questionnaires cover the need to communicate data originating from forms used in medical history exami records. In many systems this data is collected using user-defined screens and forms. Questionnaires def what order, what choices for answers were, etc. Each of these questions is part of the Questionnaire, and the individual questions are not. (Questionnaire questions can be linked to shared data elements using th

Examples of Questionnaires include:

Content | Examples | Detailed Descriptions | Mappings | Profiles & Extensions | R3 Conversions

2.38 Resource QuestionnaireResponse - Content

FHIR Infrastructure Work Group	Maturity Level: 3	Trial Use	Security Category: Patient	Compartments: Device, Encounter, Patient, Practitioner, RelatedPerson

A structured set of questions and their answers. The questions are ordered and grouped into coherent subsets, corresponding to the structure of the grouping of the questionnaire being responded to.

2.38.1 Scope and Usage

QuestionnaireResponse provides a complete or partial list of answers to a set of questions filled when responding to a questionnaire. The questions may be included directly or by reference to a Questionnaire resource that defines the questions as well as the constraints on the allowed answers. In some cases, both formal rules for editing the questionnaire (via link to Questionnaire) as well as sufficient local information to allow rendering of the questionnaire may be provided.

Each time a questionnaire is completed for a different subject or at a different time, a distinct QuestionnaireResponse is generated, though it may be possible for a previously entered set of answers to be edited or updated.

Questionnaire responses cover the need to communicate data originating from forms used in medical history examinations, research questionnaires and sometimes full clinical specialty records. In many systems this data is collected using user-defined screens and forms. Questionnaire responses record specifics about data capture - exactly what questions were asked, in what order, what answers were given, etc. Each of these questions is part of the Questionnaire, and as such the Questionnaire is a separately identifiable Resource, whereas the individual questions are not.

Example of FHIR Questionnaires usage

- Assessments (Primary Care)
- Past medical history
- Social history
- Care Plans
- Public Health Reporting
- General data entry

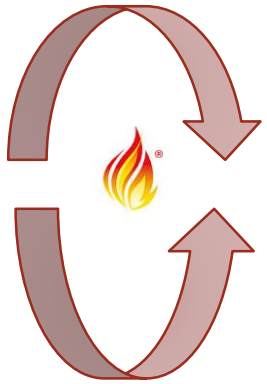
HL7 is also working on "Structure Data Capture" implementation standards proposal

https://build.fhir.org/ig/HL7/sdc

Narrative QuestionnaireResponse

Assessment

- Systolic blood pressure? 118
- Diastolic blood pressure? 88



```
<item>
    <linkId value="assessment" />
    <item>
        <linkId value="systolic_bp" />
        <definition value="http://HKCTT/102215" />
        <answer>
            <valueString value="118" />
        </answer>
    </item>
    <item>
        <linkId value="diastolic_bp" />
        <definition value="http://HKCTT/102214" />
        <answer>
            <valueString value="88" />
        </answer>
    </item>
</item>
```

Question Entity ID

Answer

Question Entity ID

Answer

Diagnosis

- Clinical Notes
- Diagnosis
  - diagnosis 1
    - diagnosis code? HTC
    - diagnosis Term ID? 7529
  - diagnosis 2
    - diagnosis code? HYPERLIPIDAEMIA

```
<item>
    <linkId value="notediagnosis" />
    <item>
        <linkId value="clinical notes" />
        <definition value="http://HKCTT/1007355" />
        <answer><valueString /></answer>
    </item>
    <item>
        <linkId value="diagnosis" />
        <definition value="http://HKCTT/-2145204080" />
        <item>
            <linkId value="repeat item sid" />
            <answer>
                <valueString value="1" />
            </answer>
            <item>
                <linkId value="diagnosis_v" />
                <definition value="http://HKCTT/1006311" />
                <answer>
                    <valueCoding>
                        <system value="https://www.ehealth.gov.hk/hkctt/diagnosis_v" />
                        <code value="HT" /><display value="Hypertension" />
                    </valueCoding>
                </answer>
                <item>
                    <linkId value="diagnosis_v_tid" />
                    <answer><valueString value="7529" /></answer>
                </item>
            </item>
        </item>
        <item>
            <linkId value="repeat item sid" />
            <answer>
                <valueString value="2" />
            </answer>
            <item>
                <linkId value="diagnosis_v" />
                <definition value="http://HKCTT/1006311" />
                <answer>
                    <valueCoding>
                        <system value="https://www.ehealth.gov.hk/hkctt/diagnosis_v" />
                        <code value="HYPERLIPIDAEMIA" /><display value="Hyperlipidaemia"
/>                    </valueCoding>
                </answer>
                <item>
                    <linkId value="diagnosis_v_tid" />
                    <answer><valueString value="4323" /></answer>
                </item>
            </item>
        </item>
```

Question entity ID

Answer

Question entity ID

Answer

Answer

Question entity ID

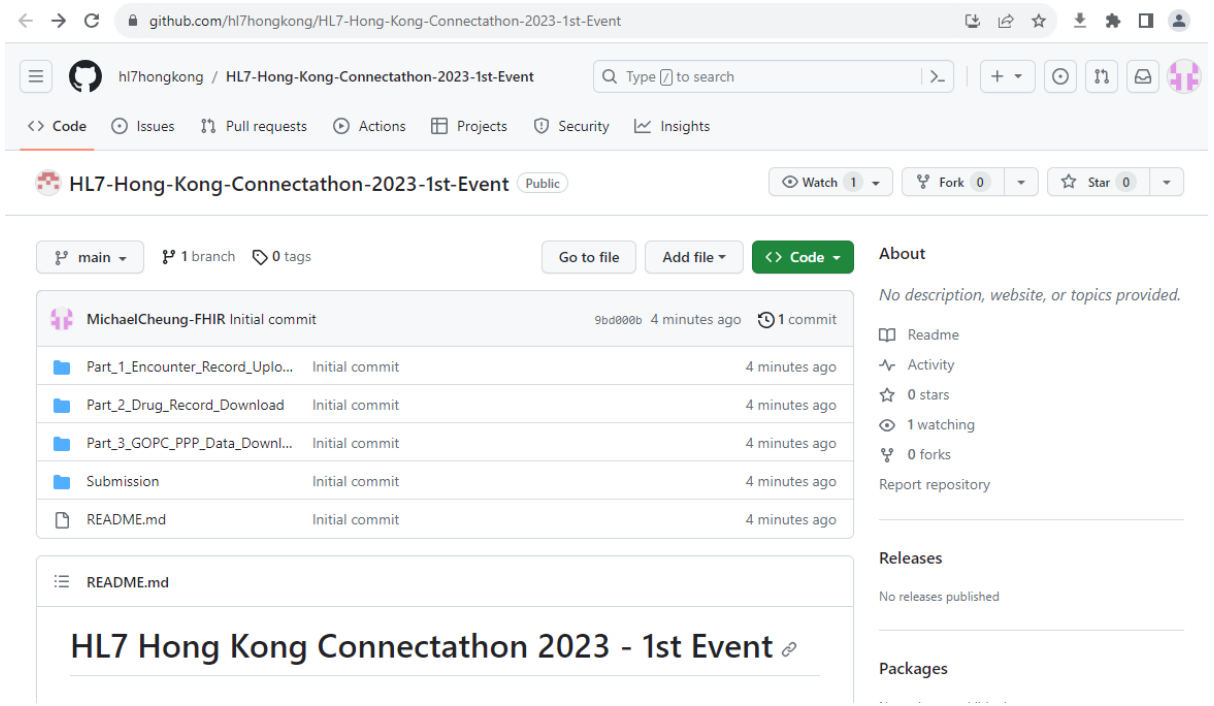
Answer

Answer

Challenge

Specifications

- Specifications of all three topics can be found at
  - https://github.com/hl7hongkong/HL7-Hong-Kong-Connectathon-2023-1st-Event



Exercise

- Following the instructions at the GitHub
  - Submit the answers via
    - Fork the repository by pull request and update the file inside the “Submission” directory
    - Google Form
      - https://forms.gle/QFNXffVbbMB9kYnr7

Format of the exercise

- Fill in the data into message template
- Based on the scenario, select the correct message (multiple choice)
- Based on the sample messages, find out the data, e.g.
  - What is the name of patient for the medication order?
  - what is the patient's body temperature?

Follow-up sessions

- Review the answers from participants and discuss on the specifications

- Zoom link:
  - https://ha-org-hk.zoom.us/j/98886201384 (Passcode: 069734)