Article
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Open Exchange

An example on finding inconsistencies in FHIR data

As I said in the previous article, I started to learn about FHIR for the contest, and I'd like to share an update in my application: detection of inconsistencies in FHIR data.

Note: This document it's also availble in GitHub.

A useful usage for FHIR unified schema is search for inconsistencies. As suggested by @Qi Li
, one example could be find patients with records for diabetes medication, however, without diabetes condition.

Another example is search conditions with findings (like diabetes, for instance) and a record for resources denoting "no known problems", e.g., SNOMED CT: "160245001 ¦No current problems or disability (situation)¦", as discussed in HL7 FHIR documentation.

So, in order to deal with them, I setup two SQL KPIs for querying FHIR SQL schema and return resources which m atch to these kinds of inconsistencies. For input, I manually changed some files which are imported when the contai ner is created.

For diabetes medication inconsistence, I choose a patient without diabetes conditions and insert manually a diabet es medication (file Mikel238Dickinson68862644b68-f18b-46e0-86f9-56b3cb2f6737.json
). I found the medication code by searching for "snomed ct insulin".

```
"medicationCodeableConcept": {
  "coding": [
    {
      "system": "http://snomed.info/sct",
      "code": "325072002",
      "display": "Insulin Aspart (substance)"
    }
  ],
  "text": "Lantus 100 unit/ml injectable solution"
```

For "no known problems" inconsistencies, I changed th
e file Adina377Corkery305cb12851a-2ebd-4c15-88a9-5bee0f308afc.json
, and add a "160245001 ¦No current problems or disability¦" record in an pre-existing "190905008" ¦Cystic Fibrosis¦" condition.

```
"coding": [

  {

    "system": "http://snomed.info/sct",

    "code": "160245001",

    "display": "No current problems or disability"

  },

  {

    "system": "http://snomed.info/sct",

    "code": "190905008",

    "display": "Cystic Fibrosis"

  }

],
```

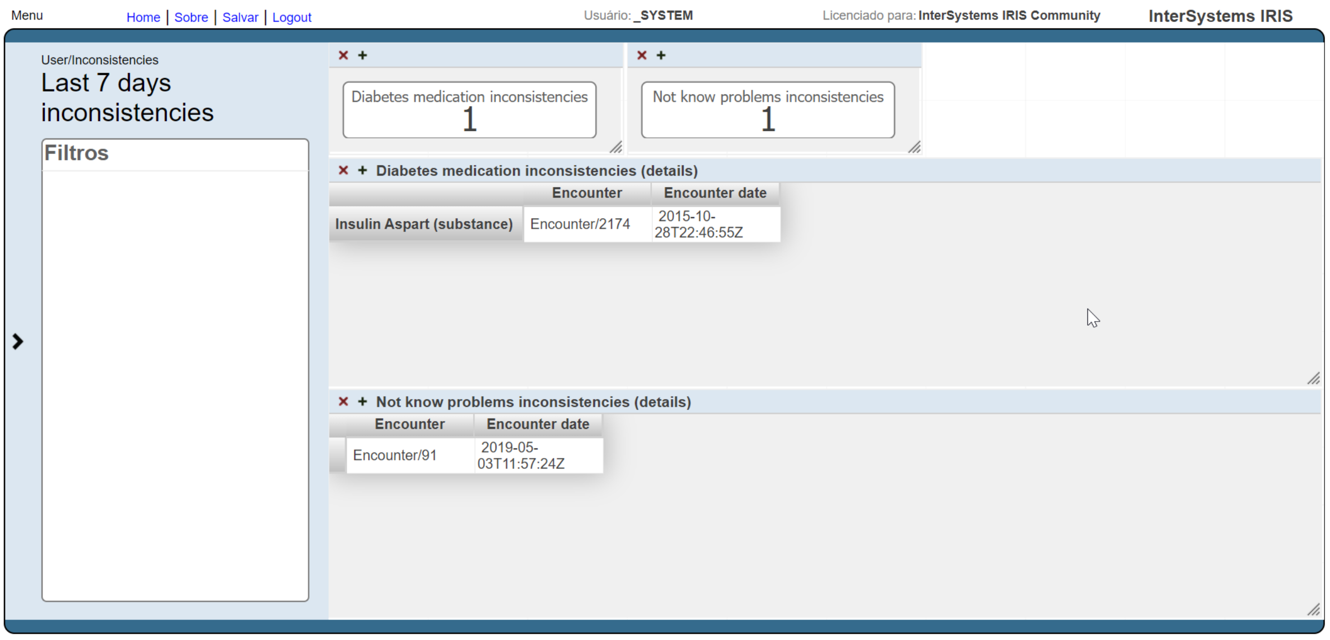
Then, the two SQL shown below were setup. The first one gets diabetes medication inconsistencies; the second, "no known problems" inconsistencies:

```
-- patients with diabetes medication but no diabetes condition

SELECT

  (

  SELECT GetProp(GetJSON(GetAtJSON(GetJSON(GetJSON(ResourceString, 'medicationCodeableConcept'), 'coding'),0), 'display'), 'display') FROM HSFHIR_I0001_R.Rsrc r where r.Key = m.Key

  ) "Medication (ingredient)",

  encounter "Encounter",

  authoredon "Encounter date"

FROM HSFHIR_I0001_S.MedicationRequest m

WHERE

  -- data inserted for last 7 days

  _lastUpdated BETWEEN DATEADD('dd', -7, CURRENT_TIMESTAMP) and CURRENT_DATE
  -- diabetes medication

  AND $LISTGET(m.code, 1) %inlist $LISTBUILD('96367001','420837001','421367005','420609005','325072002','427292001','414515005','411529005','411530000','412210000','426313003','422346007')

  -- no diabetes condition

  AND 0 = (

    SELECT count(*) FROM HSFHIRI0001S.Condition c

    WHERE

    -- diabetes conditions

    $LISTGET(c.code, 1) %inlist $LISTBUILD('73211009','733072002','530558861000132104','609568004','609569007','105401000119101','199223000','703136005','46635009','44054006','111552007','716362006','123763000','722206009','8801005')

    AND m.patient = c.patient

  )



-- conditions with "no known problems" no properly

SELECT

  '',

  encounter "Encounter",

  onsetDate "Encounter date"

FROM HSFHIRI0001S.Condition

WHERE

  -- data inserted for last 7 days

  lastUpdated BETWEEN DATEADD('dd', -7, CURRENTTIMESTAMP) and CURRENTDATE

  -- 160245001 = no known problems

  AND $FIND(code, 160245001) > 0

  -- more than 1 condition code recorded (each code recorded generates 2 entries into code list - code and its description)

  AND $LISTLENGTH(code) > 2
```

I found codes for diabetes conditions and medications in the CDC site, here and here.

These SQL feed up the KPIs DiabetesMedicationInconsistence and NoKnowProblemsInconsistence, respectively.

Finally, I setup a dashboard where this information is diplayed. Note that two inconsistencies issue were detected - one for each of them.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Licenciado para: InterSystems IRIS Community
InterSystems IRIS
User/Inconsistencies
Last 7 days inconsistencies
Filtros

Diabetes medication inconsistencies 1

Not know problems inconsistencies 1

Diabetes medication inconsistencies (details)

	Encounter	Encounter date
Insulin Aspart (substance)	Encounter/2174	2015-10-28T22:46:55Z

Not know problems inconsistencies (details)

Encounter	Encounter date
Encounter/91	2019-05-03T11:57:24Z

#Contest #FHIR #InterSystems IRIS for Health
Check the related application on InterSystems Open Exchange

Source URL: https://community.intersystems.com/post/example-finding-inconsistencies-fhir-data