

Let's Build! Quality Measures

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Resources

- CQF Start – Measure Evaluation
 - <https://github.com/DBCG/cqf-starts>
- Measure Evaluation Walkthrough
 - <https://github.com/DBCG/cqf-ruler/wiki/Quality-Measure-Evaluation-Walkthrough>
- Docker container with pre-loaded CQF Ruler:
 - `docker run -p 8080:8080 harmoniq:connectathon-22-preloaded`
- Instance of that container:
 - <http://connectathon22.alphora.com/cqf-ruler>

Tools

- Atom Editor
 - Simple, open source text editor
- language-cql
 - Atom plugin
 - Syntax highlighting
 - Error detection
 - Translation to ELM

The screenshot shows the 'Community Packages' section of the Atom editor. It lists two installed packages:

- atom-ide-ui 0.13.0** (1,192,012 users)
A collection of Atom UIs to support language services.
Developer: facebook-atom
Actions: Settings, Uninstall, Disable
- language-cql 2.0.0** (699 users)
Clinical Quality Language support in Atom
Developer: cqframework
Actions: Update to 2.0.1, Settings, Uninstall, Disable

Scenarios

- Measure evaluation
- Collect data
- Submit data
- Measure reporting
- Better measures with better data

Quality Measures in FHIR

CQL Declarations

```
library BCS_FHIR version '1.0.0'

using FHIR version '3.0.0'

valueset "Absence of Left Breast Value Set": 'urn:oid:2.16.840.1.113883.3.464.1004.1329.1' // ICD10CM
valueset "Absence of Right Breast Value Set": 'urn:oid:2.16.840.1.113883.3.464.1004.1330.2' // ICD10CM
valueset "Bilateral Mastectomy Value Set": 'urn:oid:2.16.840.1.113883.3.464.1004.1042' // Grouping
valueset "Mammography Value Set": 'urn:oid:2.16.840.1.113883.3.464.1004.1168' // Grouping
....

parameter "Measurement Period" Interval<DateTime>

context Patient
```

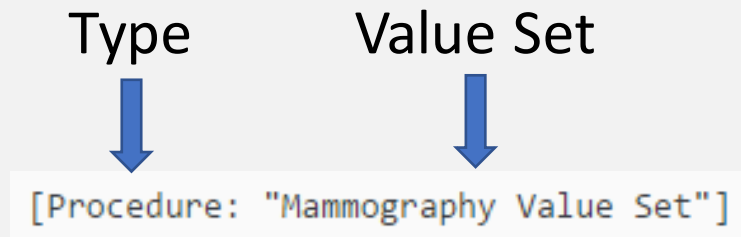
Initial Population

```
define "Initial Population":  
  "Is Female"  
  and "Is Age 52 to 74 at End"  
  
define "Is Female":  
  Patient.gender = 'female'  
  
define "Is Age 52 to 74 at End":  
  AgeInYearsAt(end of "Measurement Period") between 52 and 74
```

Denominator/Numerator

```
define "Denominator":  
  "Initial Population"  
  
define "Numerator":  
  "Initial Population"  
  and "Has Mammogram In Last 36 Months"  
  
define "Has Mammogram In Last 36 Months":  
  exists(  
    [Procedure: "Mammography Value Set"] Proc  
    where Proc.status = 'completed'  
    and Proc.performed during Interval[start of "Measurement Period" - 2 years, end of "Measurement Period"]  
  )
```


The “Retrieve” and DataRequirements



Retrieve “Procedures” for this patient that have a code that is a member of the “Mammography Value Set”

```

"dataRequirement": [
  {
    "type": "Procedure",
    "codeFilter": [
      {
        "path": "code",
        "valueSetString": "Mammography Value Set"
      }
    ]
  }
],

```

Dynamic Data Requirements

```
[Procedure: "Mammography Value Set"] Proc
  where Proc.status = 'completed'
  and Proc.performed during Interval[start of "Measurement Period" - 2 years, end of "Measurement Period"]
```

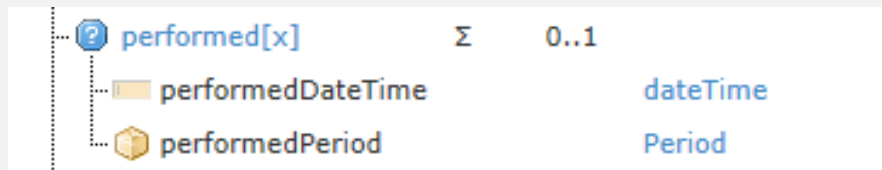
```
[base]/Measure/bcs/$data-requirements&periodStart=2016&periodEnd=2016
```

```
"dataRequirement": [
  {
    "type": "Procedure",
    "codeFilter": [
      {
        "path": "code",
        "valueSetString": "Mammography Value Set"
      }
    ],
    "dateFilter": [
      {
        "path": "performed",
        "valuePeriod": {
          "start": "2014-01-01",
          "end": "2016-12-31"
        }
      }
    ]
  }
],
},
```

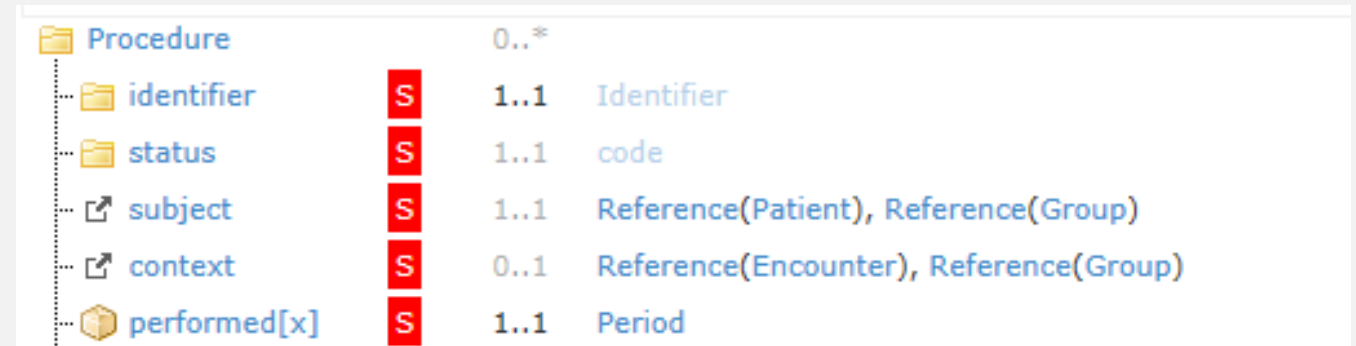
Using Profiles to Communicate Requirements

```
[Procedure: "Mammography Value Set"] Proc
  where Proc.status = 'completed'
  and Proc.performed during Interval[start of "Measurement Period" - 2 years, end of "Measurement Period"]
```

Procedure resource:

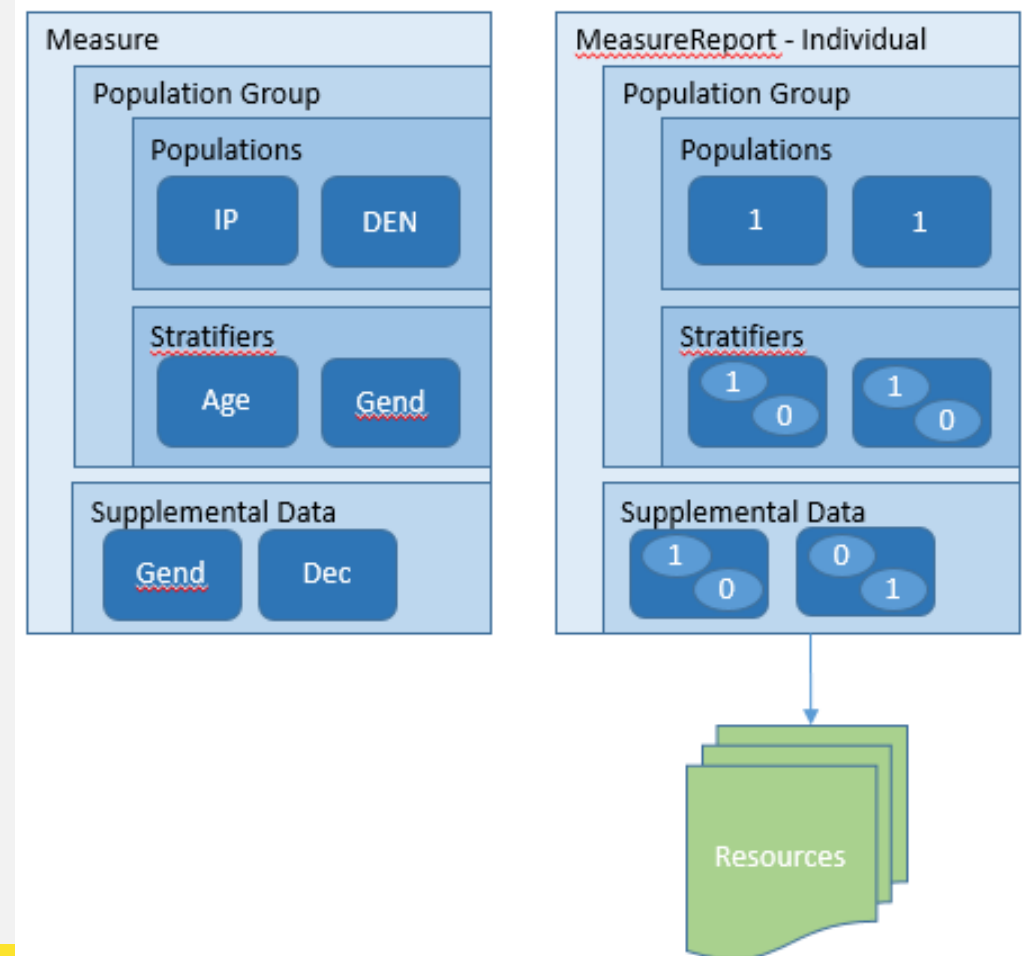


HEDIS Procedure Profile:



MeasureReport

- Individual – Evaluates the measure for a given patient
- Summary – Evaluates the measure for a population
- Patient-list – Evaluates for a population, but returns as a bundle of individual measure reports



CQF Start - Scenarios

Better Measures with Better Data

Can we do better?

```
define "BRACA Mutation Procedures":  
  [Procedure: "BRACA1 or BRACA2 Mutation Test"] P  
    where P.status = 'completed'  
      and P.outcome = 'positive finding'  
  
define "BRACA Mutation Observations":  
  [Observation: "BRACA1 or BRACA2 Mutation"] O  
    where O.status in { 'final', 'amended' }  
  
define "History of BRACA Mutation":  
  [FamilyMemberHistory] F  
    where F.status = 'completed'  
      and F.relationship in { 'CHILD', 'PRN', 'SIB' } // NOTE: CHILD here includes adopted, should be excluded  
      and ( F.condition.code in "BRACA Mutation Observations"  
        or F.condition.code in "BRACA Mutation Procedures"  
      )  
)
```

Refined BCS Measure

```
define "Initial Population":  
  Common."Is Female"  
  and ("Is Age 52 to 74 at End"  
    or "Is Age 42 to 74 at End and Has BRACA Mutation Results"  
  )  
  
define "Denominator":  
  "Initial Population"  
  
define "Numerator":  
  Common."Has Mammogram In Last 36 Months"  
  
define "Denominator Exclusion":  
  (Common."Is Lacking Both Breasts"  
    or (Common."Is Lacking Left Breast"  
      and Common."Is Lacking Right Breast"))
```