Knowledge Management
Using CDS-Hooks and the Clinical Query Language as an Enabler for BPM+
March 12, 2020

Bo Dagnall
CTO, Perspecta

Shane McNamee MD
CMIO, Perspecta

Rob Reynolds
COO, DCG

Julie Scherer MD
Chief Data Scientist, Motive Medical Intelligence
Problem

Care with Boundaries

True patient centered care is obstructed by a litany of IT boundaries that markedly increase cost and complexity to achieve to achieving health and well being goals.

Facts:

It takes 17 years for best practices to spread across healthcare workflows

Over the past 4 decades we have seen a 31X increase in U.S. per capita healthcare costs.

Medical knowledge doubles every 73 days
Solution

Care without Boundaries

• Standards driven, Open IT movement to build a Public Health Utility to rationalize our healthIT ecosystem

• Significantly reduce the time for clinical decision support and knowledge to be integrated into the workflow

• Identify high risk patients from cohorts early, intervene early

• Knowledge without Boundaries
  → standardized data artifacts
  → standardized knowledge artifacts
  → standardized knowledge services

Standards are driving the next great disruption in healthcare

FHIR

Clincial Quality Language (CQL)
Data artifacts

```
{
    "resourceType": "Condition",
    "clinicalStatus": "active",
    "verificationStatus": "confirmed",
    "category": [
        {
            "coding": [
                {
                    "system": "http://terminology.hl7.org/CodeSystem/condition-category",
                    "code": "encounter-diagnosis",
                    "display": "Encounter Diagnosis"
                }
            ]
        },
        {
            "code": {
                "coding": [
                    {
                        "system": "http://snomed.info/sct",
                        "code": "116280000",
                        "display": "Paralytic stroke (disorder)"
                    }
                ]
            },
            "subject": {
                "reference": "Patient/denom-EXM185-FHIR3"
            }
        }
    ]
}
```
Knowledge artifacts

Clinical Quality Language (CQL)

library EXM124_FHIR3 version '7.2.000'

using FHIR version '3.0.0'

parameter "Measurement Period" Interval<DateTime>
  default Interval[@2019-01-01T00:00:00.0, @2020-01-01T00:00:00.0]

context Patient

define "Numerator":
  exists "Pap Test Within 3 Years"  

define "Denominator":
  "Initial Population"

define "Pap Test Within 3 Years":
  "Pap Test with Results" PapTest
  where (PapTest.effective) ends 3 years or less before end of "Measurement Period"

define "Pap Test with Results":
  [Observation: "Pap Test"] PapTest
  where PapTest.value is not null
  and PapTest.status in { 'final', 'amended', 'corrected', 'preliminary' }

define "Initial Population":
  Patient.gender = 'female'
  and 'CalendarAgeInYearsAt'(Patient.birthDate, start of "Measurement Period") in Interval[23, 64]
Knowledge services

- Clinical Decision Support
- Quality Measures
- Medical Calculators
Demo

Knowledge Engineering, Publication and Dynamic Discovery
Chronic Kidney Disease – ePocket card
BPM+ Health, FHIR and CDS Hook automation

Human Readable

Human and Machine Readable

VA/DoD CKD Pocketcard:
Operationalization: Binding Decision Nodes to Knowledge Services

Key decisions in the model
Bound to knowledge services brokered through HealthConcourse

VA/DoD CKD Pocketcard:
Care without Boundaries

healthconcourse