Open Source Software Tools for Electronic Clinical Quality Measures

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Objectives

• Define electronic clinical quality measures (eCQMs)

• Describe open source software and tools available for electronic specification, testing and certification of clinical quality measures
  – The electronic clinical quality measure testing tool (Bonnie)
  – The 2014 certification tool used for clinical quality measure software solutions (Cypress)
  – The clinical quality measure software tool that empowers providers (popHealth)

• Provide eCQM Open Source Tools discussion opportunity
Clinical Quality Measures

• What are Clinical Quality Measures (CQM)?
  – Tools that help us measure a segment of healthcare delivery
  – Each CQM has a different goal: effective, safe, efficient, patient-centered, equitable, and/or timely care

• Clinical Quality Measures are key components of the Meaningful Use program as part of the HITECH Act
The Goal for Clinical Quality Reporting in Meaningful Use

**Accurate and Reliable** Measures of Quality

**Reduce Burden** on Providers and Vendors

**Expedite** National Implementation of CMS Programs

**Increase Measurement** within Healthcare

Is the quality of care improving in this country?
Electronic CQMs (eCQMs)

• What are eCQMs?

• eCQMs are based on information extraction from Electronic Health Records (EHRs)
  – Being considered for use in various programs
  – Can be exceedingly complex, difficult to implement, and testing requires alignment to several intricate interoperability standards
  – eCQMs are key components of the Meaningful Use program
  – eCQM CMS Library Reference:
    
The Changing Landscape

Payment Models

- Reimbursement for Services Provided
- Reimbursement for Quality of Care Provided

Quality Measurement

- Sampling
- Total Population
Background – Open Source Software for Clinical Quality Measures

• Freely available via an Apache 2.0 Open Source distribution license
  – Industry friendly and permissive for integrators and use of code
  – Attribution only requirement for use, integration and redistribution

• Three Open Source Tools are available to support clinical quality measures
  – Bonnie
  – Cypress
  – popHealth

• Meaningful Use CQM definitions are the only exception to the Apache 2.0 license
  – CQM measure questions should be directed to the measure stewards

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Background – Open Source Software for Clinical Quality Measures

• Objective: Grow a community of contributors with transparent governance spanning U.S. Government, commercial vendors, healthcare providers and stakeholders, academic and non-profit organizations and individual contributors.
Standards

Stage 2

• Standardization of code sets:
  – Logical Observation Identifiers Names and Codes (LOINC ®)
  – Systemized Nomenclature of Medicine (SNOMED)
  – International Statistical Classification of Diseases and Related Health Problems (ICD)-9 and ICD-10
  – RxNorm (normalized names for clinical drugs)
  – CVX Codes (vaccine administered codes)

• Health Quality Measures Format (HQMF) R1 introduced (eCQM representation)

• Quality Reporting Data Architecture (QRDA) Category 1 (Single patient output)

• QRDA Category 3 (Aggregate output)
Use of CQM Standards

- Patient Data
- Patient data
- Other inputs
- eMeasure
- HQMF format
- EHR
- Quality Reports
- Calculations
- Summary Reports

- Data capture defined by QDM
- Data exported to QRDA Category I reports
- Calculation of eCQMs in HQMF
- QRDA Cat III Reports
Use of CQM Standards

- Use of CQM Standards
- Data exported to QRDA
- Category I reports
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EHR

- Quality Reports
- Calculations
- Summary Reports

- eMeasure HQMF format

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Bonnie

• What is Bonnie?
  – A testing tool for eCQMs sponsored by Centers for Medicare & Medicaid Services (CMS) and the Office of the National Coordinator for Health Information Technology (ONC)

• Software Goals
  – Support streamlined and efficient pretesting of eCQMs

• End Users
  – The developers of eCQMs
Impact

- Testing is critical to the accuracy of eCQMs
- Automation provides an efficient and scalable process
- Calculation as part of testing ensures a discrete execution path prior to vendor implementation and certification
- A dynamic testing application allows better insight and understanding of how eCQMs behave
Use of CQM Standards

Data captured defined by QDM -> EHR -> Quality Reports -> Calculations -> Summary Reports

- Data exported to QRDA Category I reports
- Calculation of eCQMs in HQMF
- QRDA Cat III Reports

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**Cypress**

- **What is Cypress?**
  - The official eCQM testing tool for the 2014 EHR Certification program

- **Software Goals**
  - Provide rigorous and repeatable open source testing tool for verifying the calculation of Meaningful Use Stage 2 CQMs

- **End Users Defined**
  - ONC Authorized Testing Labs
  - Vendors

- **Impact**
  - Used to certify over 58 EHR systems
Certified Health IT Product List (CHPL)

• Certified technologies under the ONC HIT Certification Program are eligible to be used for the CMS EHR Incentive Programs

• Authoritative, comprehensive listing of complete EHRs and EHR Modules

• Tested and certified under the ONC Health Information Technology (HIT) Certification Program

• Certification ensures secure, functional technologies

• Each module has been tested and certified

• Maintained by ONC

• Certification ID provided

• [http://oncchpl.force.com/ehrcert](http://oncchpl.force.com/ehrcert)
Use of CQM Standards

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Reporting

Stage 2

• CQMs are core part of being a “meaningful user of Health IT”
• Providers now submit quality reports to CMS
  – Patient level and summary reports
  – Reports include supplemental information (race, age, sex, etc.)
popHealth

• What is popHealth?
  – An open source reference implementation for Meaningful Use Stage 2 clinical quality measures

• Software Goals
  – Empower healthcare providers to understand their clinical quality measures
  – Enables commercial vendors to calculate clinical quality measures for Meaningful Use

• End Users Defined
  – Healthcare providers
  – EHR vendors

• Impact
  – Being used by a federal agency to support their MU certification within their distributed ecosystem
Tools: popHealth

Software Runs Inside Provider's Network

HEALTHCARE PROVIDER

EHR System → Patient-Level Data (QRDA Category 1) → File Importer → DB Adapter → Population Health Reporting Database → Measure Engine → HTTPS

Quality Report (QRDA Category 3) → Public Health Case Report → Immunization and Response Management

HiMSS: transforming health through IT

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Reporting: QRDA Category III

• Summary, population level results for one or more eCQMs
• Stratification by supplemental data
• Replaces the PQRI Registry XML specification used in MU1

Guides for QRDA implementation and reporting can be found at www.qualitynet.org and www.cms.gov
Getting Help: Links

Where do I find details?

• CMS http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html
• USHIK http://ushik.org/
• ONC http://www.healthit.gov/
• CHPL http://oncchpl.force.com/ehrcert
• NLM / VSAC https://vsac.nlm.nih.gov/
• AHRQ http://www.qualitymeasures.ahrq.gov/
• NQF http://www.qualityforum.org/measures_reports_tools.aspx

Whom do I ask questions?

• CQI resource center / Jira http://jira.oncprojecttracking.org/browse/CQM
• ONC S&I/SITE http://wiki.siframework.org/
• Regional Extension Center Staff http://www.healthit.gov/providers-professionals/regional-extension-centers-reces
• HITRC http://hitrc-collaborative.org/
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