Bonnie eCQM Testing Tool

Presenter:
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Bonnie is an electronic Clinical Quality Measure (eCQM) testing tool that allows users to:

- **Load eCQMs** from the Health Quality Measure Format (HQMF) exported from Measure Authoring Tool (MAT)
- **Build synthetic patients** using data elements defined as part of the measure definition
- **Test new and updated eCQMs** using synthetic patients
- **Explore the behavior and complexity** characteristics of eCQMs
Prior to Bonnie, the only way to test eCQMs was by hand.  
- eCQMs are **large and complex**.  
- Checking by hand is **time consuming and error prone**.

Before Bonnie was in use, **381 logic errors** were reported by implementers. **Each eCQM had at least one error**.
History

• First released April 2014
• Used for 2015, 2016, and 2017 annual update eCQMs
  – 2015: Over 5,000 synthetic test patient records, 80% logic coverage
  – 2016: Over 10,000 synthetic test patient records, 100% logic coverage
  – 2017: Over 16,000 synthetic test patient records, 100% logic coverage
• National Quality Forum (NQF) recommends use of Bonnie to support NQF eCQM endorsement
Standards in Bonnie

• Bonnie uses the following eCQM-related standards:
  – Health Quality Measure Format (HQMF)
  – Quality Data Model (QDM)
  – Quality Reporting Document Architecture (QRDA)
  – Clinical Quality Language (CQL) (future)

• Bonnie is regularly updated to align with the latest standard versions
Resources

• Public website: https://bonnie.healthit.gov/
• User guide: https://bonnie.healthit.gov/resource/Bonnie_user_guide.pdf
• Git repository: https://github.com/projecttacoma/bonnie
Backup Slides
<table>
<thead>
<tr>
<th>Measure</th>
<th>Expected</th>
<th>Status</th>
<th>Test Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>simple discharged on antithrombotic therapy</td>
<td>0%</td>
<td>NEW</td>
<td>0 / 0</td>
</tr>
<tr>
<td>ADE Prevention and Monitoring: Warfarin Time in Therapeutic Range</td>
<td>100%</td>
<td>PASS</td>
<td>1 / 1</td>
</tr>
<tr>
<td>Discharged on Antithrombotic Therapy</td>
<td>50%</td>
<td>FAIL</td>
<td>2 / 4</td>
</tr>
<tr>
<td>Intensive Care Unit Venous Thromboembolism Prophylaxis</td>
<td>100%</td>
<td>PASS</td>
<td>3 / 3</td>
</tr>
</tbody>
</table>
Bonnie

Measure Period: 2012
CMS522v0

CMS522V0

Measure Details

Simple Discharged on Antithrombotic Therapy

Complexity:

Initial Population:

AND: Patient Characteristic Birthdate: Birth Date >= 18 years starts before start of "Measurement Period"
AND: Occurrence A: Encounter, Performed: Inpatient Encounter during "Measurement Period"
AND: Diagnosis: Ischemic Stroke starts during Occurrence A: Encounter, Performed: Inpatient Encounter

Denominator:

None

Denominator Exclusions:

SIMPLE DISCHARGED ON ANTITHROMBOTIC THERAPY

Complexity: ✔

Initial Population:

AND: Patient Characteristic Birthdate: Birth Date >= 18 years starts before start of "Measurement Period"
AND: Occurrence A: Encounter, Performed: Inpatient Encounter during "Measurement Period"
AND: Diagnosis: Ischemic Stroke starts during Occurrence A: Encounter, Performed: Inpatient Encounter

Denominator:
None

Denominator Exclusions:

OR: Occurrence A: Encounter, Performed: Inpatient Encounter during "Measurement Period"

0% NEW 0:0
0% COVERAGE

MEASURE UPLOAD HISTORY

**ELEMENTS**

**PATIENT HISTORY**

**ENCOUNTER**
- **DATE**: 03/12/2012 – 03/12/2012
- Performing: Inpatient Encounter

**DIAGNOSIS**
- **DATE**: 03/12/2012 – 03/12/2012
- Ischemic Stroke

**MEDICATION**
- **DATE**: 03/12/2012 – 03/12/2012
- Discharge: Antithrombotic Therapy

**CMS522V0**

**INITIAL POPULATION:**
- **DATE**: 03/12/2012 – 03/12/2012
- Patient Characteristic: Birthdate: Birth Date >= 18 years starts before start of "Measurement Period"
- **DATE**: 03/12/2012 – 03/12/2012
- Occurrence A: Encounter, Performed: Inpatient Encounter during "Measurement Period"
- **DATE**: 03/12/2012 – 03/12/2012
- Occurrence: Ischemic Stroke starts during **DATE**: 03/12/2012 – 03/12/2012
- Occurrence A: Encounter, Performed: Inpatient Encounter

**DENOMINATOR:**
- None

**DENOMINATOR EXCLUSIONS:**
- Occurrence A: Encounter, Performed: Inpatient Encounter (Discharge Status: Left Against Medical Advice)

**NUMERATOR:**
- Occurrence A: Encounter, Performed: Inpatient Encounter, Discharge: Antithrombotic Therapy during Occurrence A: Encounter
Screenshot 16

Th Screenshot of Bonnie
CMS522V0

MEASURE DETAILS

SIMPLE DISCHARGED ON ANTITHROMBOTIC THERAPY

Complexity: ✔

Initial Population:

AND: Patient Characteristic Birthdate: Birth Date >= 18 years before start of "Measurement Period"
AND: Occurrence A: Encounter, Performed: Inpatient Encounter during "Measurement Period"
AND: Diagnosis: Ischemic Stroke starts during Occurrence A: Encounter, Performed: Inpatient Encounter

Denominator:
None

Denominator Exclusions:

FAIL: Ischemic With Meds
PASS: Ischemic No Meds
SIMPLE DISCHARGED ON ANTITHROMBOTIC THERAPY

Initial Population:

AND: Patient Characteristic Birthdate: Birth Date >= 18 years starts before start of "Measurement Period"
AND: Occurrence A: Encounter, Performed: Inpatient Encounter during "Measurement Period"
AND: Diagnosis: Ischemic Stroke starts during Occurrence A: Encounter, Performed: Inpatient Encounter

Denominator:
None

Denominator Exclusions:

FAIL 1/2

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