Prepared for:

Centers for Medicare & Medicaid Services

and

Office of the National Coordinator for Health Information Technology

CMS Alliance to Modernize Healthcare
Federally Funded Research and Development Center

Technical Authority for the Unified Clinical Quality Improvement Framework

Bonnie User Guide

Initial Draft

Version 0.1

April 15, 2014

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Record of Changes

Version	Date	Author / Owner	Description of Change
0.1	April 15, 2014	Andre Quina / MITRE	Initial draft

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1. Introduction

1.1 Background

Bonnie is a software tool that allows Meaningful Use (MU) Clinical Quality Measure (CQM) developers to test and verify the behavior of their CQM logic. The main goal of the Bonnie application is to reduce the number of defects in CQMs by providing a robust and automated testing framework. The Bonnie application allows measure developers to independently load measures that they have constructed using the Measure Authoring Tool (MAT). Loading the measures into Bonnie converts the measures from their Extensible Markup Language (XML) eSpecifications into executable artifacts and measure metadata. The measure metadata is then used to allow developers to rapidly build a synthetic patient test deck for the measure using the clinical elements defined during the measure construction process. By using measure metadata as a basis for building synthetic patients, developers can rapidly and efficiently create a test deck for a measure. The Bonnie application helps measure developers execute the measure logic against the constructed patient test deck and evaluate whether the logic aligns with the intent of the measure.

Bonnie has been designed to integrate with the nationally recognized data standards used by the Meaningful Use program for expressing CQM logic for machine-to-machine interoperability. This provides enormous value to the CQM program and federal policy leaders and stakeholders: this software tool verifies that the new and evolving standards for the Meaningful Use CQM program are tractable and can be implemented in software.

Bonnie was also designed to provide an intuitive and easy-to-use interface based on feedback from the broader measure developer community. A key goal of the Bonnie application is to deliver a user experience that provides an efficient and intuitive method for constructing synthetic patient records for testing and validating CQMs.

Finally, the Bonnie software is freely available via an Apache 2.0 open source license. The Meaningful Use program makes all or parts of the Bonnie software available for inspection, verification, and even reuse by other government programs or federal contractors.

1.2 Purpose

The purpose of this document is to provide a description of the functionality of the Bonnie web application that allows measure developers to test and verify the behavior of their CQM logic. This document provides Bonnie users with step-by-step instructions for testing CQMs by building synthetic patient records.

1.2.1 Application Description

Bonnie is a web The Bonnie application provides the capability to import measures defined in Health Quality Measure Format (HQMF) XML. The HQMF specification provides the metadata and logic that describe the specifics of calculating a CQM. The Bonnie application can load the HQMF describing a measure and programmatically convert the HQMF specification into an executable format that allows calculating the measure directly from the specification.

The CMS Measure Authoring Tool (MAT) is the primary source for HQMF documents used by the Bonnie application. Measure developers use the MAT to build CQMs and export those measures as measure bundles containing both the HQMF and value sets used as part of calculation. These measure bundles can be downloaded from the MAT and loaded into the Bonnie user interface for measure testing.

Once a CQM has been loaded into the Bonnie application, a user can inspect the measure logic and then build synthetic test records and set expectations on how those test records will calculate against a measure. This capability to build synthetic test patient records, set expectations against those records, and calculate the measures using those patient records provides an automated and efficient testing framework for CQMs. Using the Bonnie-supported CQM testing framework allows measure developers to more clearly understand the behavior of the measure logic, validate that the measure logic encodes their intent, and allows for multiple iterations of measure updates to be validated against a test deck. In addition, the development of a test deck as part of measure development provides benefits after the measures are finalized. The test deck build as part of measure development can be used to demonstrate the intent of the measure though the use of patient examples included in the test deck. Furthermore, the test deck provides systems that implement the measures with a means to validate the development of their systems. This is provided in the form of a base set of synthetic patient records with known expectations for calculating against the implemented measures. Finally, the test deck could be used as a basis for the test deck used as part of the Meaningful Use certification program.

2. User Account Creation

2.1 Login Page

Users require a valid account for access to the Bonnie application. All measures loaded into the Bonnie application and all synthetic test patients are isolated by account. Therefore, a user can only view, access, and modify data that they have loaded under their own account. Figure 1 shows the login screen for the Bonnie application. To log in, a user must provide the email address and password for a valid account.

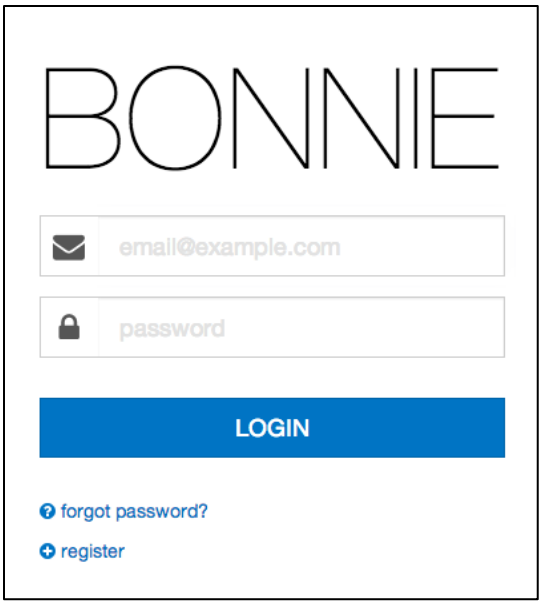

Figure 1.Bonnie Login Page

2.2 Creating a New User

A user can create a new account by clicking on the “Register” link on the login page. The register link brings the user to the account creation page (Figure 2). A user can create a new account by filling out the fields in the registration form and clicking the “Register” button. Once an account has been created, the

user can log in to the Bonnie application using the email address and password specified as part of account creation.

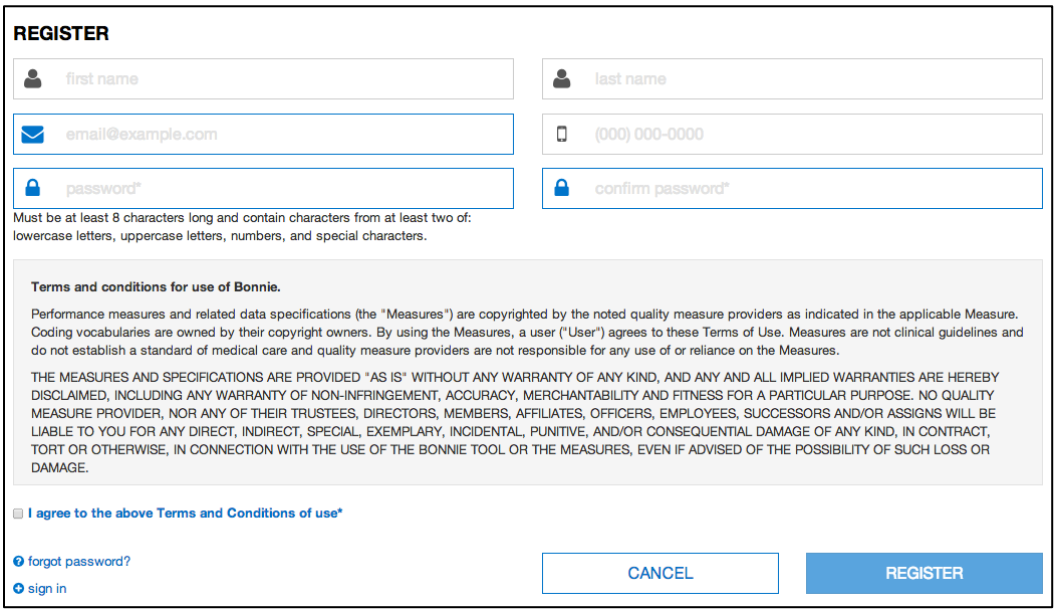

Figure 2. Account Registration Page

2.3 Resetting Your Password

In the event that a password is forgotten or an account is locked, the user can reset the password using the password reset page. This page is accessed from the “Forgot Password?” link on the login page (Figure 1). On this page, the user can provide the email address associated with the account and then press the “Send” button. This will send an email to the registered email address for the account to allow the user to reset the password for the account.

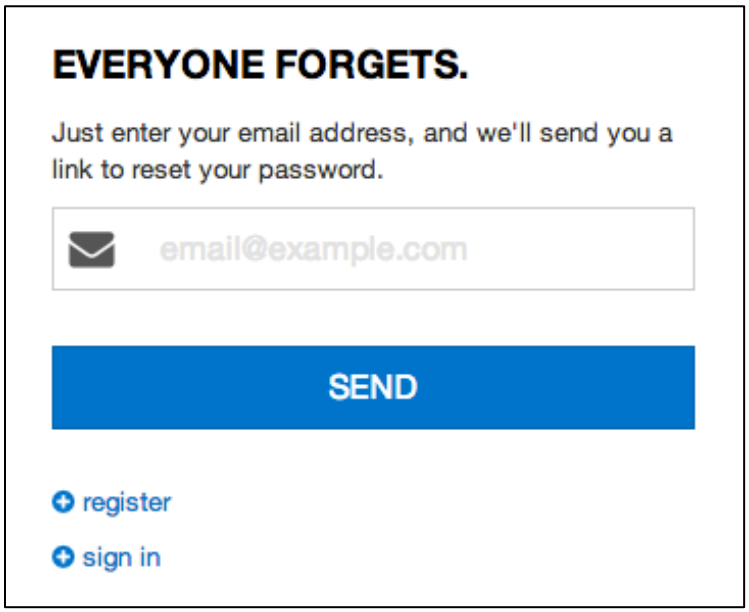

Figure 3. Password Reset Page

2.4 Account Management

Once a user has logged into the application, the user can change the information associated with their account by accessing the account management page (Figure 4). The account management page can be opened by clicking on the "account" link in the header of the application. The application header is shown in Figure 5 and labeled as user interface element number 9. The account management page allows the user to change the information provided during the registration process and select a new password for their account.

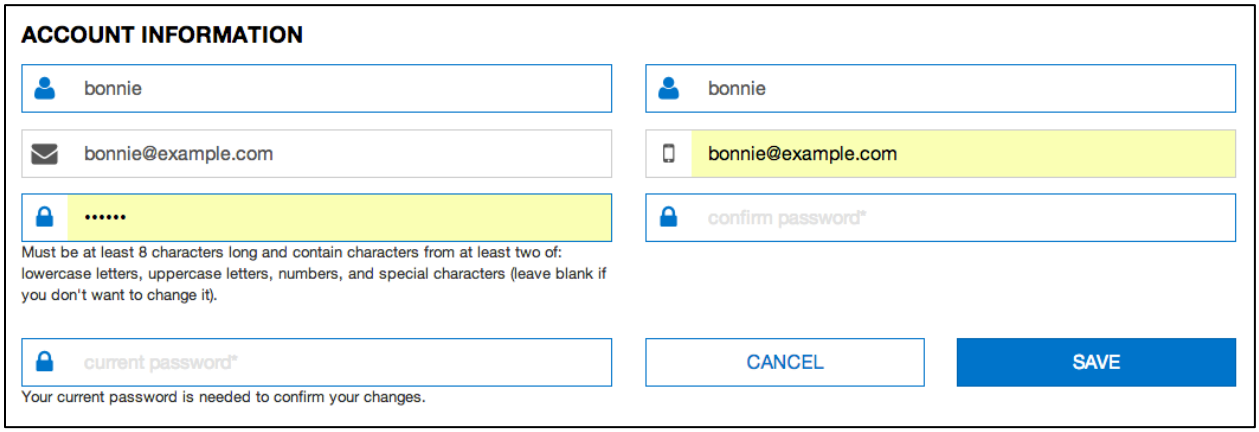

Figure 4. Account Management Page

3. Measure Dashboard

3.1 Overview

The Measure Dashboard page, as shown in Figure 5, is the initial page presented to users when they log into the application. This page displays the set of measures the user currently has loaded into the system along with the sub-populations and stratifications associated with the measures. The Measure Dashboard shows the calculation status of each measure loaded into the system. The calculation status shows how many patients have been built for the measure, whether the measure is currently passing or failing, and how many patients are passing or failing for each measure. The Measure Dashboard also allows users to navigate to the details of individual measures, to upload a new measure, or to update the definition of an existing measure.

The Measure Dashboard View employs the following UI elements (indicated by their item numbers in Figure 5):

1. Measure Title – Displays the title for the measure and allows navigating to the measure view.
2. Sub population and stratification titles – Displays the titles for sub populations or stratifications of a measure.
3. Upload Button – Allows the user to upload a new measure.
4. Update Button – Allows the user to update a previously loaded measure.
5. Expected Column – Displays the percentage of passing patients for the measure.
6. Status Column – Displays the current status of the measure (New, Pass, Fail)

7. Test Patient Column – Displays the number of patients passing out of the total number of patients.
8. Add Patient Button – Allows the user to start building a new patient for a measure.
9. Header – Allows the user to access account information, send a support email (Contact), and log out of the application.
10. Measure Period Date – Displays the measurement period that is used for calculating measures.

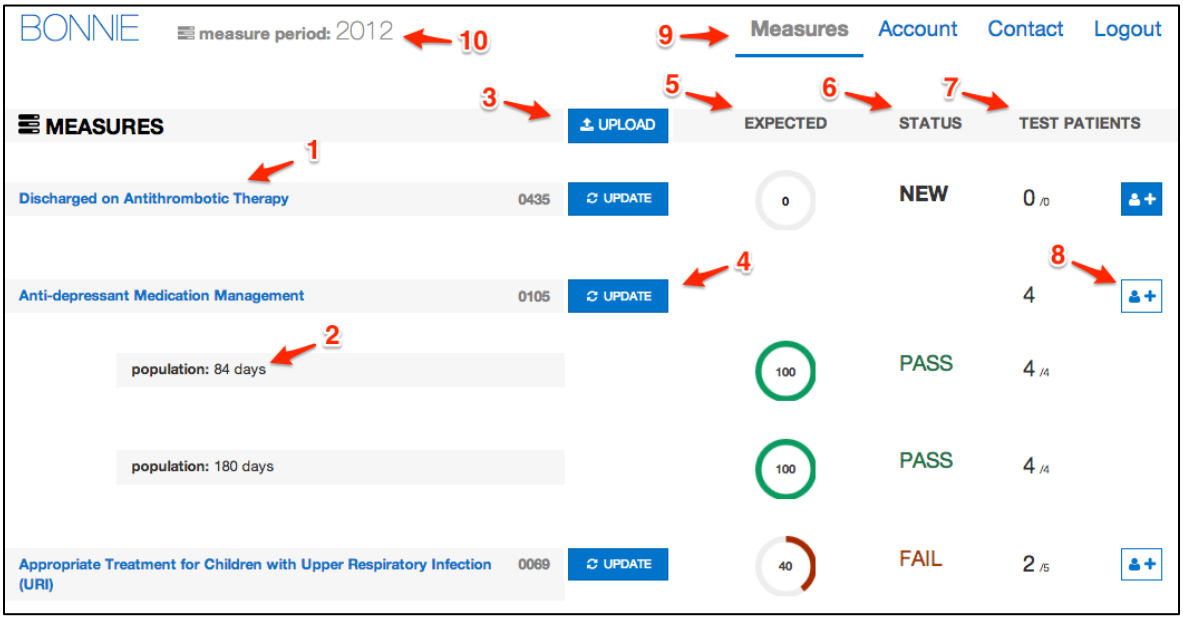

Figure 5. Measure Dashboard View

3.2 Loading a New Measure

When a user logs into the system for the first time, there will be no measures associated with the account. The user's first step is to load a measure into the account to begin testing the measure with the Bonnie application.

The steps for loading a new measure are:

1. Click the "Upload" button (item #3) on the Measure Dashboard, which opens the "New Measure Dialog.
2. On the New Measure Dialog (Figure 6)
    a. Choose a MAT export zip file
    b. Specify if the measure is eligible professional (EP) or eligible hospital (EH)
    c. Specify if the measure is Patient based or Episode of Care
    d. Click the "Load" button

The action of clicking the "Load" button in the New Measure Dialog uploads the measure to the application for processing. If the measure loaded is episode of care or has multiple populations, the user is presented with the Finalize Measure Dialog (Figure 7). This dialog allows the user to specify the episode(s) of care for the measure and to provide titles for sub populations. Once the finalize measure fields have been filled out, the user clicks the "Done" button to finish loading the measure. Once measure

loading is complete, the user is taken to the Measure Dashboard (Figure 5) with the new measure available. If the measure is not episode of care or does not have sub populations, then the user will not be presented with the Finalize Measure Dialog because no additional information is required to load the measure.

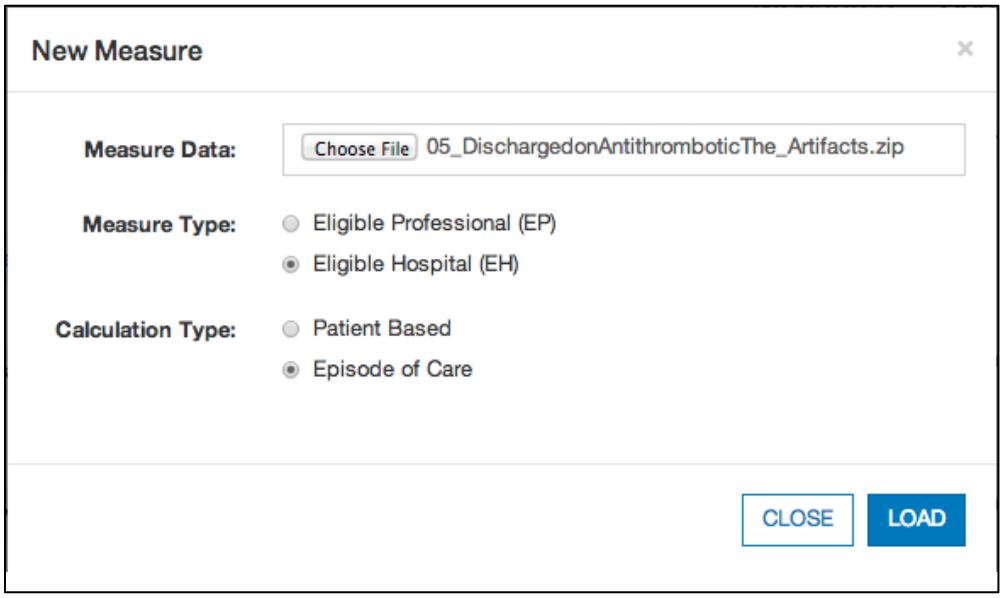

Figure 6. New Measure Dialog

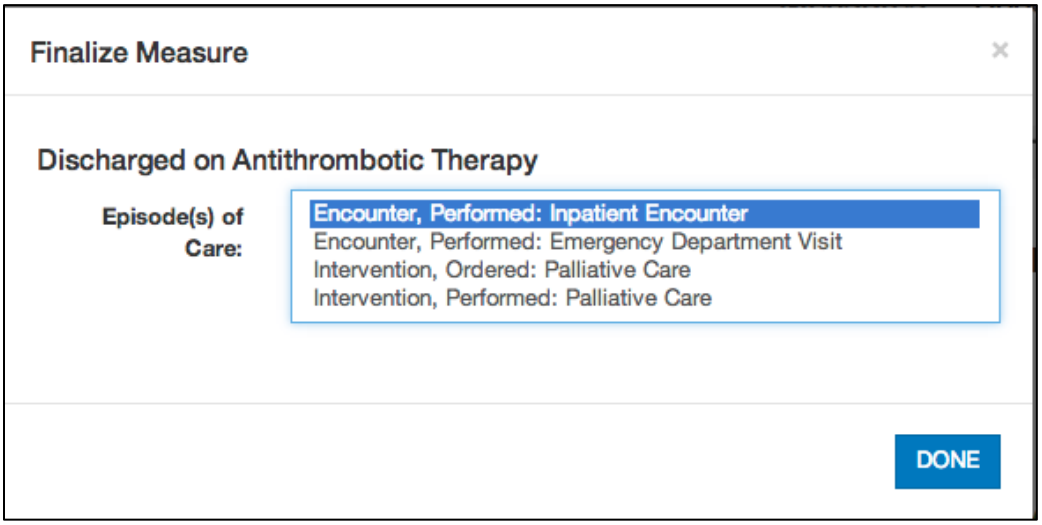

Figure 7. Finalize Measure Dialog

3.3 Updating a Measure

Once the measure has been loaded, the testing process may identify issues with the measure. When issues are identified with a measure, the logic must be updated in the MAT to resolve these issues. Alternatively, the measure could be updated in the MAT as part of an annual update. Once a measure has been updated in the MAT, it may be necessary to update that measure in Bonnie for testing. To update a measure, follow these steps:

1. Click the "Update" button (#4) on the measure dashboard, which displays the "Update Measure" dialog (Figure 8).
2. Select a new MAT export zip with the updated measure definition.
3. Update the episode of care if it has changed.
4. Click the "Load" button to load the new version of the measure.

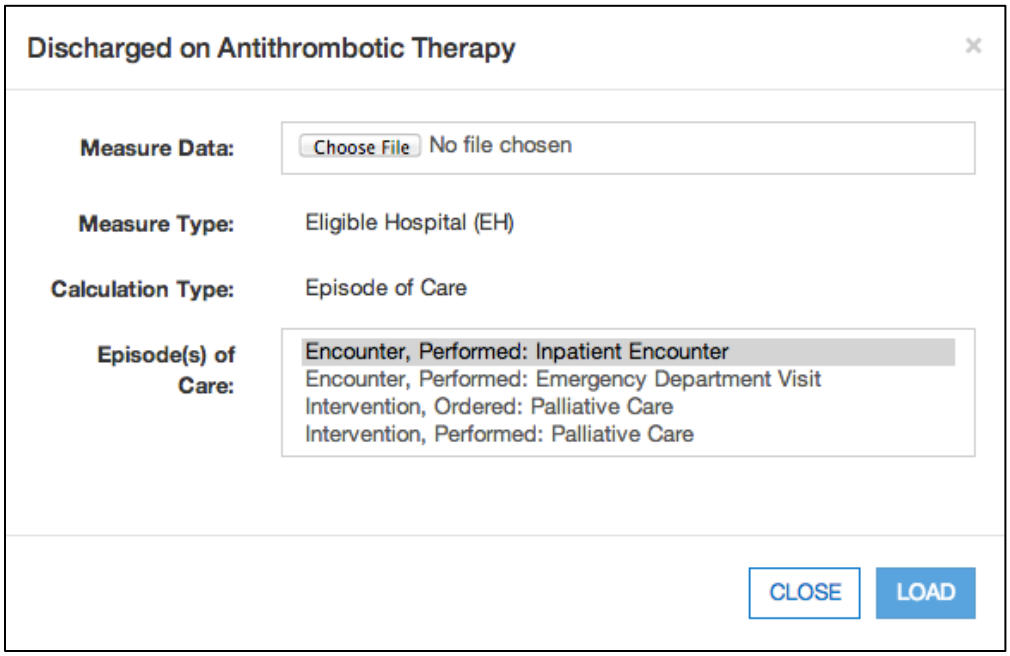

Figure 8. Updating Measure Dialog

3.4 Creating Synthetic Test Records

Once a set of measures has been loaded into the Bonnie application, users can start building test patients for the measures. To build a test patient from the measure dashboard (Figure 5), the user clicks on the "Add Patient" button (item #8 in Figure 5). This action opens the patient builder (see Figure 13). For more information, go to Section 5, *Building a Patient Test Record*.

3.5 Calculation Results

After the user creates synthetic test patients for measures, the Measure Dashboard will display summary calculation results of the patients associated with each measure loaded by the user (Figure 5). As shown in Figure 5, UI elements items #5, #6, and #7 on the Measure Dashboard provide the summary results for each measure. In the "expected" column (item #5), the UI displays the percentage of patients associated with the measure whose calculated values meet the expectations set for the patient. The "Status" column (item #6) indicates the current state of the measure—whether it is passing, failing, or new. A measure is in the passing state if all associated patients are meeting expectations. If one or more patients are not meeting expectations, then the measure is in a failing state. Any measure that does not have patients associated with it is in the new state. Finally, the "Test Patients" column (#7) displays the number of passing patients over the total number of patients as a fraction. The measure view, as represented in Figure 9 in Section 4, shows more detailed results for a measure.

4. Measure Results View

4.1 Overview

As shown in Figure 9, the Measure View page displays the detailed information, associated patients, and calculation results for a single measure. The Measure View allows the user to add new patients to a measure, update a measure, and delete a measure. To access the Measure View, the user clicks on the "Measure Title" link (#1) on the Measure Dashboard as depicted in Figure 5.

The Measure View page presents the title (item #1) and description (item #2) of the measure along with the logic for the measure (item #3). The page also displays the current set of test patients associated with the measure as a list in the column on the right-hand side of the page. This column displays the summary calculation results for the patient test deck associated with the measure along with the list of patients and the individual calculation results for each. This page shows the results of calculation for a single patient along with an overlay of the calculation results on the measure logic.

The Measure View page employs the following IS elements (indicated by their item numbers in Figure 9):

1. Measure Title – Displays the title of the measure.
2. Measure Description – Displays the description of the measure.
3. Measure Logic – Displays a representation of the logic for the measure.
4. Measure Actions – Allows the user to delete or update a measure definition.
5. Percent Successful – Displays the percent of patients currently meeting expectations for the measure.
6. Test Coverage – Displays the percentage of the measure logic that has evaluated to true for the patient test deck. This provides a method for determining how much of the logic has been tested.
7. Logic Highlighted With Coverage – Displays the logic for the measure highlighting which lines of the measure are covered by the test patients.
8. Failing Patient – An example of a patient that is not currently meeting expectations for the measure.
9. Passing Patient – An example of a patient that is meeting expectations.
10. Patient Name – Displays the name given to the patient.
11. Patient Status – Displays PASS or FAIL to indicate if the patient is meeting expectations.
12. Expand Patient Results Button – Allows displaying the details of the calculation of a patient. This will show the expected and actual values for the patient against the measure.
13. Add Patient Button – Allows adding a new patient to the test deck for this measure.
14. Patients passing count – Displays the current number of patients meeting expectations over the total number of patients in the test deck for the measure.
15. Patient Actions – Allows the user to export patient records.

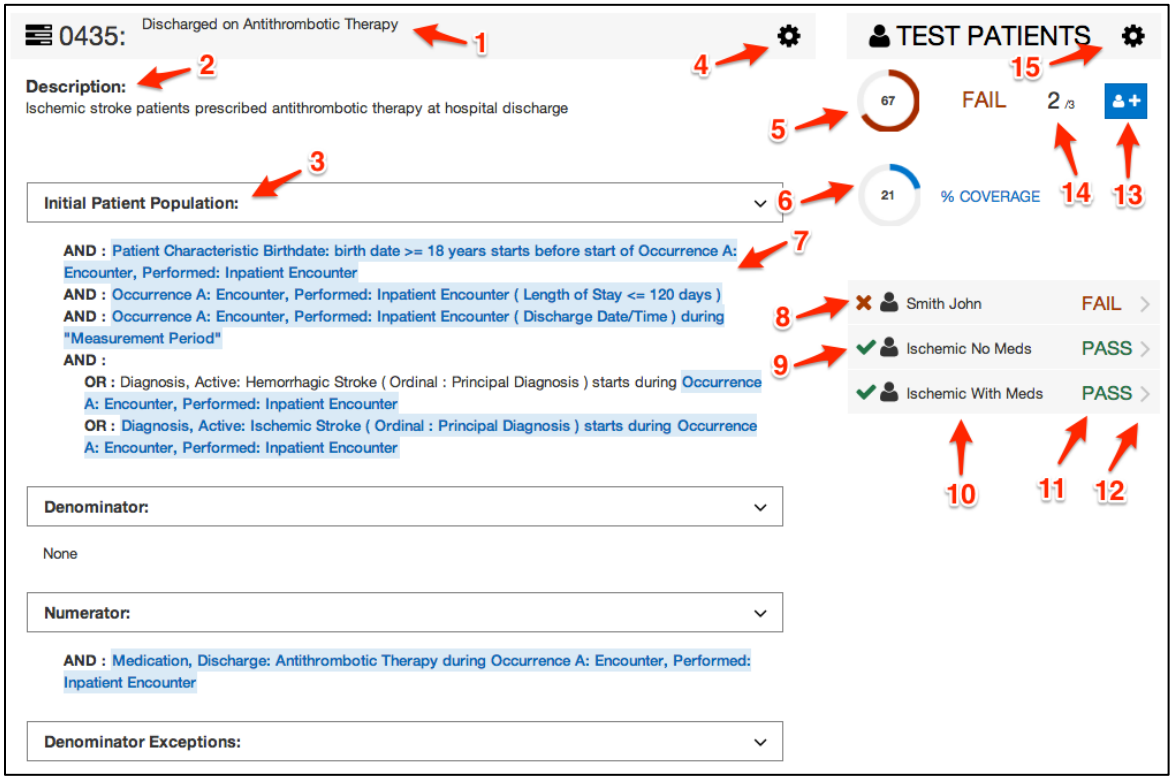

Figure 9. Measure View

4.2 Measure Logic

The left-hand side of the Measure View contains the measure title, description, and a representation of the logic. The representation of the measure logic is similar to the human-readable display for the measure provided in the MAT measure exports. There are some differences in the structure of the logic that are a result of restructuring that is done while parsing the measure logic from the HQMF specification. The most notable difference is that relative timings applied to logical groups are distributed down into the statements of the logical group rather than displayed at the level of the grouping.

The measure logic section can be used to verify that the measure logic was properly loaded from the HQMF without the loss of any logical conditions. The logic can also be used to evaluate the nature of the calculation of a test patient against the logic (please refer to subsection 4.4, *Calculation Results*) and to visualize the test coverage of the measure logic.

4.3 Creating a New Test Record

To create a new test record, the user begins by clicking on the “Add Patient” button (item #13) in the Measure View (Figure 9). This action opens the Patient Builder (as shown in Figure 13). Once a patient record has been created, the application returns the user to the Measure View where the user can evaluate the results of calculating the patient against the measure.

4.4 Calculation Results

Once the user has constructed a test patient record, the user can calculate that patient against the logic of the measure in the Measure View (Figure 9). High-level results are calculated automatically when the

Measure View is loaded. These high-level results appear under the test patients section on the right-hand side of the Measure View. These results include the percent of patients passing (item #5), the test coverage (item #6), individual statuses for each patient (items #8, #9, #11), and the passing patient count (item #14).

In addition to these high level results, detailed results can be displayed for an individual patient by clicking the "Expand Patient Results" button (#12). This displays a table of expected and actual results for the patient covering each population listed in the measure and shows whether that population is currently meeting or failing expectations.

The Expanded Results View employs the following UI elements (as indicated by their item numbers in Figure 10):

1. Passing Population – A population for which the patient passes.
2. Failing Population – A population for which the patient fails.
3. Population Column – A listing of the population types.
4. Expected Value – The user-defined expected value for the population.
5. Actual Value – The calculated value for that population.
6. Edit Patient Button – Allows editing the selected patient.
7. Clone Patient Button – Allows cloning the selected patient.
8. Delete Patient Button – Allows deleting the selected patient.

Figure 10. Expanded Results View

Clicking the "Expand Patient Results" button (item #12 in Figure 9) also displays the patient results calculated against each line of logic. This is displayed in the measure logic section of the view (item #3) by highlighting the lines of logic. As shown in Figures 11 and 12, a light green highlight indicates a passing result for the logic calculation, while a pastel rose highlight indicates a failing result over the applicable lines of text.

Figure 11. Logic Calculation Highlight – Passing Results

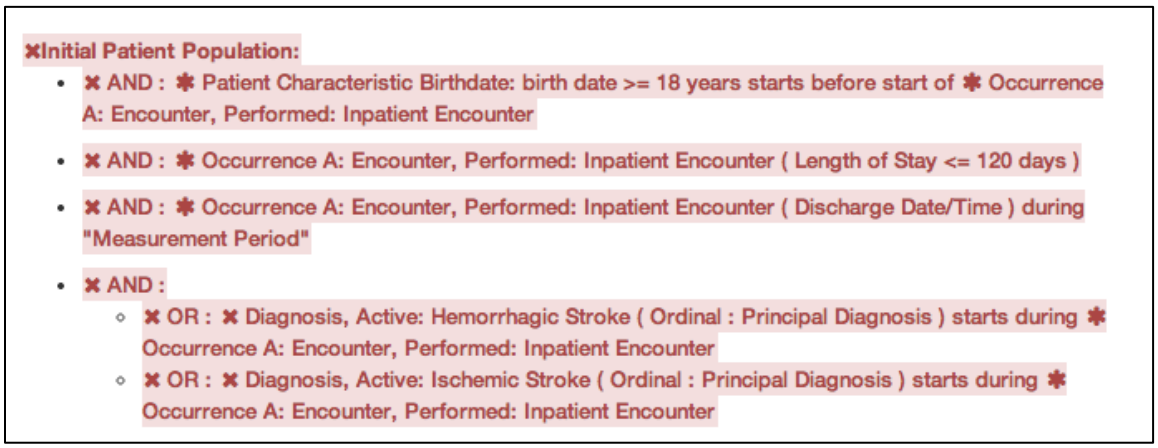

Figure 12. Logic Calculation Highlight – Failing Results

Figure 11 shows the results of a single patient calculated against the measure logic. The measure logic highlighting for calculation is intended to provide a clearer understanding of why a patient is calculating to a specific population. The highlighting of the logic uses the following indications of status:

- **Logic evaluated to TRUE** – light green highlighting of the logic text along with a checkmark icon
- **Logic evaluated to FALSE** – pastel red highlighting of the logic text along with an "X" icon

- **Unaligned Specific Occurrences** – pastel red highlighting of the logic text along with a bold asterisk icon

The results of the calculation shown in Figure 11 are that the patient aligns with the logic of the initial patient population (IPP). The highlighting of the logic in Figure 11 indicates that every AND condition was evaluated to true and at least one condition from each OR was evaluated to true. Based on this calculation, the IPP evaluates to true for the patient.

In Figure 12, all the logical statements are highlighted in pastel red, indicating that all statements evaluate to false. Figure 12 also shows unaligned specific occurrences. This state indicates that the line of logic would evaluate to true if it were not for specific occurrences. Since all logical lines related to a specific occurrence must evaluate to true for any to evaluate to true, the line does not evaluate to true. Therefore, this third indication related to specific occurrences helps to identify which lines referencing that occurrence may be causing the calculation to evaluate to false. The results calculated in Figure 12 indicate that the patient is not included in the IPP.

4.5 Editing a Test Record

The user can edit a test patient from the Measure View (Figure 9) by clicking the "Edit" button. The user accesses the "Edit" button for a patient (item #6 in Figure 10) by clicking the "Expand Patient Results" button (item #12 in Figure 9). Clicking the "Edit" button opens the Patient Builder (as shown in Figure 13) with the data populated for that patient. Once a patient record has been edited and saved, the application returns the user to the Measure View.

4.6 Cloning a Test Record

The user can clone a test patient from the Measure View (Figure 9) by clicking the "Clone" button (item #7 in Figure 10) to the immediate right of the "Edit" button. To access the "Clone" button, the user clicks on the "Expand Patient Results" button (item #12 in Figure 9). This action opens the Patient Builder (Figure 13) with the data populated for the patient being cloned. The difference between editing and cloning a patient is that the clone process creates a new patient based on an existing patient while the edit process updates the data for an existing patient. Once a patient record has been cloned, edited, and saved, the application returns the user to the Measure View.

4.7 Deleting a Test Record

The user can delete a test patient from the Measure View (Figure 9) by clicking the "Delete" icon (item #8 in Figure 10) to the immediate right of the "Clone" button. The user accesses the "Delete" icon by clicking on the "Expand Patient Results" button (item #12 in Figure 9). Deleting a patient requires a two-step process for confirmation. Once a user deletes a patient record, the action cannot be undone. To delete a patient record, the user initially clicks the "Delete" button. A second "Delete" button is then displayed. The user must click the second "Delete" button to confirm the deletion of the patient.

4.8 Updating a Measure

The user can update a measure by clicking on the "Update Measure" button. The user accesses this button by clicking on the "Measure Actions" icon (#4). The Update Measures" button displays the Update Measure Dialog (Figure 8). The Update Measure Dialog allows the user to specify a new zip package for a measure exported from the MAT. Once the new measure package has been entered, the

user clicks the “Load” button, which updates the measure definition and returns the user to the Measure View with the updated measure definition.

4.9 Deleting a Measure

The user can delete a measure from the Measure View (Figure 9) by clicking the “Delete” icon for a measure. To access the “Delete” icon for a measure, the user clicks on the ‘Measure Actions” icon (item #4). Once a user deletes a measure, the action cannot be undone. To delete a measure, the user initially clicks the “Delete” icon. A second “Delete” icon is then displayed. The user must click the second “Delete” icon to confirm the deletion of the measure. After the measure is deleted, the Measure Dashboard is displayed with the deleted measure no longer present.

5. Building a Patient Test Record

5.1 Overview

The Patient Builder view, as shown in Figure 13, allows adding and editing clinical data for a synthetic test patient record. The user accesses the Patient Builder view by clicking on the “Add Patient” button (item #5) on the Measure Dashboard (Figure 8), or by clicking the “Add Patient,” ‘Edit,” or “Clone” buttons from the Measure View (Figure 9).

The Patient Builder view provides fields to either add new data or edit existing data for a patient. The patient first and last name can be defined using the associated edit fields (item #1); characteristics such as gender, birthdate, race, and ethnicity can be set in the characteristics section (item #5); and QDM elements (item #2) can be added to the patient history section (item #4) by dragging and dropping an individual element (item #3) onto the patient history section.

In addition to defining the patient data, the Patient Builder view allows the user to set expectations on the patient using the ‘Expectations” section (item #6). Expectations represent how the user expects the patient being defined to calculate against the measure. The “Expectations” section will be different based on the type of measure for which the user is building the patient record. Patient-based measures provide a check box to select the appropriate expected populations (numerator, denominator, etc.) within which the patient will be included. Episode of care-based measures allow selecting the number of episodes of care that are expected to be included in each population using a number picker. Continuous variable measures allow users to define the expected value(s) the measure is expected to calculate for the patient.

In addition, the Patient Builder’s logic section displays the logic (item #7) of the measure against which the patient test record is constructed. As data is entered, the application continuously calculates the patient against the measure logic and the results are displayed against the measure using the logic highlighting. Subsection 4.4 provides additional information about the descriptions of the logic highlighting technique based on calculation results shown in Figures 11 and 12.

The Patient Builder View employs the following UI elements (as indicated by their item numbers in Figure 13):

1. Patient Name section – Allows the entry of a first and last name for the patient record.
2. QDM Elements – A list of QDM elements by category extracted from the measure.
3. QDM Element – An individual QDM element that can be added to the patient history.
4. Patient History – Displays the QDM elements that are associated with this patient.
5. Patient Characteristics – Allows defining characteristics data for the patient.

6. Expectations – Allows setting the calculation expectation for each population of the measure.
7. Measure Logic – Displays a representation of the logic for the measure.
8. Actions – Allows saving a patient records or canceling.

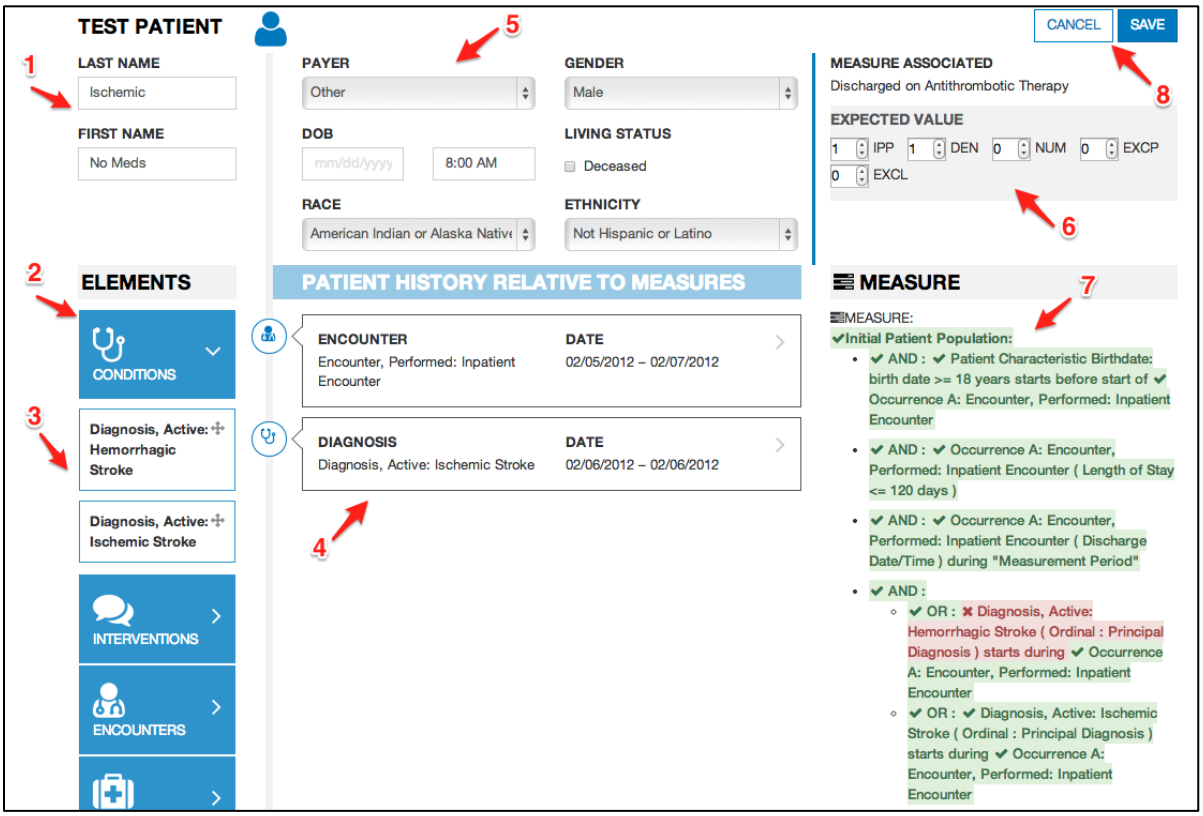

Figure 13. Patient Builder View

5.2 Building a Synthetic Patient

The first step to building a synthetic patient is defining the name of the patient. The first and last name of the patient can be set in the "Patient Name" section (item #1 in Figure 13). After defining the patient's name, the user defines the expectations for how the patient will behave and be calculated against the measure. The user sets the expectations for the patient in the "Expectations" section (item #6). If the user expects the patient to align with the initial patient population logic, then the user should set that expectation in item #6. Expectations are used throughout the Bonnie application to determine if a patient is passing or failing against the measure.

If the expected results for the patient align with the actual results from calculating the patient against the measure logic, then the patient passes. If the expected results do not match the actual calculated results, then the patient fails. This provides the capability to build patients and set expectations for those patients based on the intent of the measure. Once the measure is calculated, the passing state indicates that the measure logic aligns with the intent, while the failing state indicates that either the measure logic does not align with the intent or the synthetic patient was constructed improperly.

After the user sets expectations for the patient, the next step is to define patient characteristics. Patient characteristics can be set in the 'Patient Characteristics" section (item #5). Characteristics for the patient include such data as birthdate, race, ethnicity, gender, payer, and living status.

After the user defines the patient characteristics, the user then builds a patient history from QDM elements that were extracted from the measure. The available elements from the measure are organized by category and listed in the "Elements" section (item #2). The user can click on a category to expand the list of available elements. Expanding this list allows the user to click and drag an individual element (item #3) onto the patient history (item #4).

5.3 Building the Patient History

Figure 13 depicts two events in the patient's history—an encounter and a diagnosis—based on data elements from the measure. When a QDM element is added to the patient history, it becomes an event in the patient's history, which warrants a duration and associated fields. When an event is first created, it is given default start and end date/times, and is associated a code from each value set associated with the source QDM element. These defaults as well as additional data can be edited by expanding the event. Figure 14 shows an example of an expanded event from the patient history that can be edited. By clicking on the expand/collapse details icon (item #4), the user can edit the details of the element.

The Edit Clinical Element View employs the following UI elements (as indicated by their item numbers in Figure 14):

1. Start date/time – Allows setting the start date/time for an element.
2. End date/time – Allows setting the end date/time for an element.
3. Undefined End – Allows specifying that the end date/time is undefined (ongoing event).
4. Expand/Collapse details – Allows hiding or expanding the details of an element.
5. Value Section – Allows adding values to the element (i.e., lab result values).
6. Fields Section – Allows adding fields to the element (i.e., ordinality).
7. Negation Section – Allows indicating that the element is not done with a reason.
8. Delete button – Allows deleting an element from the patient history.

Several fields in the Edit Clinical Element View can be edited for an event in the patient history using the controls shown in Figure 14. These fields include the start date/time of the event (items #1 and #2), values (item #5), various fields (item #6), and negation rationale (item #7). The start and end date times can be set for an event by either typing into the text fields directly or by using the date/time pickers that are displayed when the field is selected. An undefined end time can be set for the event (used for active or ongoing events) by selecting the "Undefined" checkbox (item #3). Selecting the "Undefined" check box clears the end date/times, indicating that the event has not ended.

Values, fields, and negation rationale also can be set for an event. Values can be set using the "Values" section (item #5) by selecting the type of the value (scalar or coded), and then entering a scalar value or selecting a coded value from a drop-down listing of all the value sets associated with the measure. Fields such as ordinal, severity, discharge date/time, etc., can be added using the "Fields" section (item #6). Fields are added by selecting the type of the field (scalar, coded, or time) and then entering in a scalar value, selecting a value set, or entering a date.

Negation rationale can be defined for the event to indicate that the event was not done for a specific reason. Negation rationale is added by clicking the "Not Performed" checkbox in the negation section (item #7) and then selecting a value set representing the reason the event was not done.

Finally, events can be removed from the patient history by clicking on the “Delete” icon (item #8). Deletion requires a two-step process. After initially pressing the “Delete” icon, the user is prompted to depress the “Delete” icon a second time to confirm the deletion.

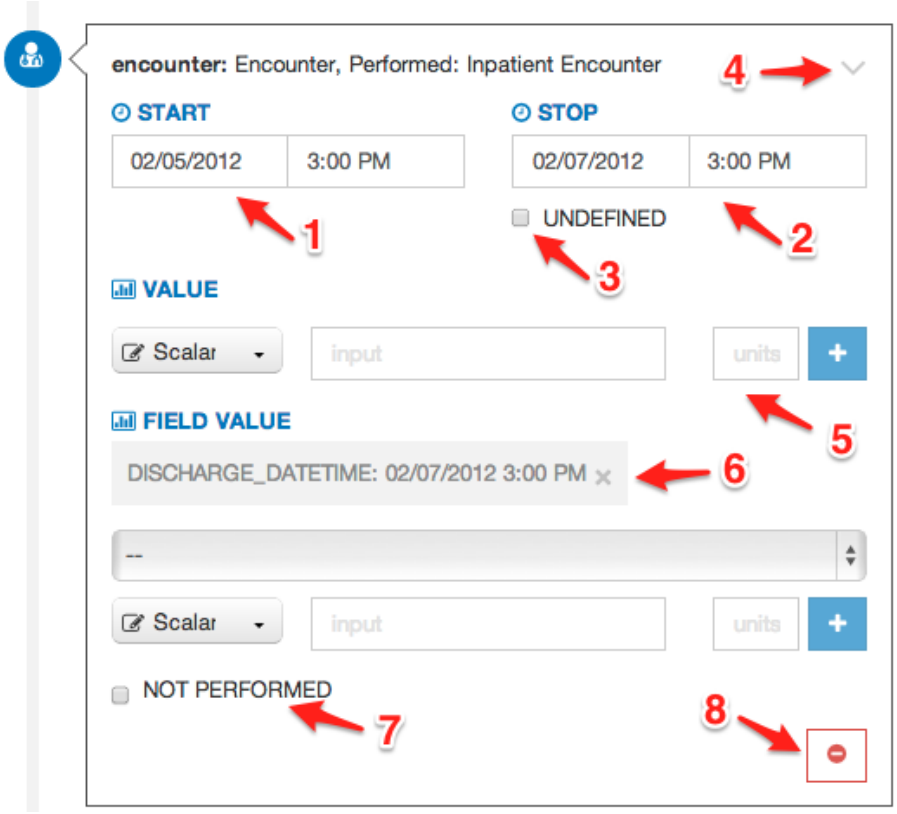

Figure 14. Edit Clinical Element View

5.4 Incremental Calculation

The final section of the Patient Builder View is the logic section. This section displays a representation of the logic for the measure against which the patient is constructed. The logic can be a reference to help inform the details of the data that should be added in building the synthetic patient.

The logic section continuously displays the results of calculating the patient against the measure by means of the logic highlighting described in Figures 11 and 12. Any modification made to a patient triggers a re-calculation of the patient against the measure, which updates the results of the calculation displayed by the logic highlighting. Therefore, as the patient is being constructed, the user can inspect the behavior of the logic relative to the patient.

When the user has completed constructing a synthetic patient, the user clicks the “Save” button in the Patient Builder View (item #8 in Figure 13), which adds the patient to the test deck for the measure and returns the user to the Measure View. After the user creates the first patient, additional patients can be created from scratch or cloned from existing patients to extend the coverage of the test deck against the measure.

6. Feedback and Support

An issue tracker and feedback email list are available to support the resolution of issues and to answer questions related to the Bonnie application. The Bonnie issue tracker is available on the ONC Jira system using the following URL:

http://jira.oncprojectracking.org/browse/BONNIE

The issue tracker should be used to report bugs encountered when using the Bonnie application, to ask questions, or to request new features. To add an issue, a login account must be created in the Jira system. Once an issue has been entered, it will be reviewed by the Bonnie team and prioritized. Alternatively, questions can also be addressed to the Bonnie feedback list bonnie-feedback-list@lists.mitre.org. The Bonnie feedback list email can be accessed using the "Contact" link in the main Bonnie navigation menu at the top of every page.