

RADV

RISK ADJUSTMENT DATA VALIDATION TOOL



Software Documentation and User Guide

May 2016

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STATEMENT OF GOALS

The Affordable Care Act requires health insurance companies to offer insurance to people with pre-existing conditions. By only offering policies with high co-pays and high-deductibles, insurance companies can discourage ill patients from purchasing their products. Risk adjustment prevents this by transferring premiums from insurers with healthy members to those organizations that are insuring for a more ill population.

Risk scores are used to determine the average level of illness in an insurers' population. A risk score is calculated using the list of diagnoses recorded for a patient during the previous calendar year and is a relative score against the average patient (risk score for an average patient=1). This gives providers and insurers a strong financial interest in making medical records accurate and complete.

The RADV tool was designed to help providers validate medical records by identifying health care conditions that may be missing from a patient's recent medical record.

BACKGROUND INFORMATION

Risk Scores are an estimate of an individual's future medical costs. Recent diagnostic history is the most important data in determining an individual's risk score. Other predictors include the individual's geographic area, age/gender and the type of insurance policy (high-deductible, low co-pays, etc.)

Risk Selection occurs when insurers try to avoid enrolling unhealthy people by making their products unattractive to people requiring costly medical care.

Risk Adjustment discourages risk selection by transferring premiums from insurers with healthy members to those with members who are more ill.

If a member has an illness, but the diagnosis code is not reported to the insurance carrier during the calendar year, their risk score will be artificially low.

This data quality issue can substantially reduce an insured's premiums. When provider payments are on a percent-of-premium basis, it also reduces payments to hospitals and doctors.

As doctors and hospitals move to a pay-for-performance structure, correct risk assessment and diagnostic codes ensure appropriate payment for treatment of patients with multiple chronic diseases.

The American Health Lawyers Association recommends the following strategies:

- Know high revenue HCCs that are often undiagnosed or under-coded
- Review missing diagnoses from prior years' HCCs and send reminders to MDs
- Audits of records vs. codes for missing codes: last year and this year.
- Conduct annual comprehensive exams for members who have not yet been seen early in the year.

EXAMPLE OF RISK SCORE ERROR & CONSEQUENCES:

A 68-year-old man with pneumonia, emphysema, diabetes with retinopathy, and respiratory failure has the following risk profile.

ICD-10 Code	Relative Risk Score
J13: Pneumococcal pneumonia	0.200
J43.9: Other emphysema	0.346
E13.39: Diabetes with ophthalmic manifestations	0.368
J96.00: Acute respiratory failure	0.329
Demographic Component	
68-Year-Old Male	0.288
Relative Risk Score	1.531

▶ If this member's risk score is 1.531, he is 53 percent more complex than the average patient.

Figure 1

ICD-10 Code	Relative Risk Score
J13: Pneumococcal pneumonia	0.200
J43.9: Other emphysema	0.346
E11.9: Diabetes mellitus without mention of complication	0.118
J96.00: Acute respiratory failure	0.329
Demographic Component	
68-Year-Old Male	0.288
Relative Risk Score	0.935

▶ One missing diagnosis code and one unspecified code reduces the relative risk score by 61 percent!

Figure 2

Source: <https://www.bcbsal.org/providers/pdfs/riskAdjustment.pdf>

A missing diagnosis code and an unspecified code (Figure 2) reduces the relative risk score by 61%.

FUNCTIONAL DESCRIPTION

For systems that use a Fast Healthcare Interoperability Resources (FHIR) Server or another centralized data source, RADV allows clinical staff and doctors to search a patient's available clinical history for any conditions that are not listed in the current year. Upon finding any missing conditions or hierarchical condition categories (HCCs), clinical staff can add the HCC to the patient's record. This facilitates accurate risk scoring and financial accounting and payments.

FUTURE OF THE APPLICATION

In its current version, RADV uses the FHIR server with artificial data provided by the Georgia Institute of Technology for educational and research purposes. A real world implementation would interact with an actual FHIR server or one of the open source FHIR servers.

POTENTIAL PARTNERSHIPS

We aim to sell our application to hospitals, insurers, health informatics organizations, and EHR developers such as Cerner, Epic Systems, and athenahealth. For all, they would buy the application from us with any customized reporting features they desire at a flat rate. We would make a maintenance agreement with the buyer unless they sought to buy the application and any intellectual property rights associated with it. Stakeholders are physicians, clinical staff including nurses, physician assistants, and medical coders, insurers, EHR developers, and health informatics organizations.

TENTATIVE FINANCIAL ESTIMATES

BALANCE SHEET

Assets	Start Date:05/31/2016	End Date:05/31/2019
CURRENT ASSETS		
Cash in bank		
Accounts Receivable	\$0	\$0
Inventory	\$0	\$0
Prepaid Expenses	\$0	\$0
Deposits	\$0	\$0
Other current Assets	\$0	\$0
TOTAL CURRENT ASSETS	\$0	\$0
FIXED ASSETS		
Machinery & Equipment	\$0	\$0
Furniture & Fixtures	\$0	\$0
Leaseholder improvements	\$0	\$0
Land & Buildings	\$0	\$0
Other fixed assets	\$0	\$0
TOTAL FIXED ASSETS(net of depreciation)	\$0	\$0
OTHER ASSETS		
Intangibles	\$10,000	\$10,000
Other		
TOTAL OTHER ASSETS	\$10,000	\$10,000
TOTAL ASSETS	\$10,000	\$10,000
Liabilities & Equity		
CURRENT LIABILITIES		
Accounts Payable	\$0	\$0
Interest Payable	\$0	\$0
Taxes Payable	\$288	\$288
Notes, short term (due in 12 months)	\$0	\$0
Current part, long-term debt	\$0	\$0
TOTAL CURRENT LIABILITIES	\$288	\$288
LONG TERM DEBT		
Bank loans payable	\$0	\$0
Notes payable to stockholders	\$0	\$0
LESS: short-term portion	\$0	\$0
Other long-term debt	\$0	\$0
TOTAL LONG-TERM DEBT	\$0	\$0
TOTAL LIABILITIES	\$288	\$288
OWNERS EQUITY		
Common Stock	\$10,000	\$10,000
Retained Earnings	\$0	\$0
TOTAL OWNERS EQUITY	\$10,000	\$10,000
TOTAL LIABILITIES & EQUITY	\$9,712	\$9,712

CASH FLOW

	Pre Startup EST	Year 1	Year 2	Year 3	Total Item EST
Cash on hand	\$0	\$0	\$16,927	\$51,831	\$68,758
CASH RECEIPTS					
Cash Sales		\$50,000	\$100,000	\$150,000	\$300,000
Collections from CR Accounts	\$0	\$0	\$0	\$0	\$0
Loan/Cash Injection	\$0	\$0	\$0	\$0	\$0
TOTAL CASH RECEIPTS	\$0	\$50,000	\$100,000	\$150,000	\$300,000
TOTAL CASH AVAILABLE(before cash out)	\$0	\$50,000	\$116,927	\$201,831	\$368,758
CASH PAID OUT					
Purchases					\$0
Gross Wages	\$0	\$17,000	\$34,000	\$51,000	\$102,000
Outside Services	\$0	\$0	\$0	\$0	\$0
Supplies	\$0	\$0	\$0	\$0	\$0
Repairs & Maintenance	\$0	\$0	\$0	\$0	\$0
Advertising	\$0	\$1,000	\$1,000	\$1,000	\$3,000
Car, delivery & travel	\$0	\$0	\$0	\$0	\$0
Accounting & legal	\$0	\$0	\$0	\$0	\$0
Rent	\$0	\$0	\$0	\$0	\$0
Telephone	\$0	\$0	\$0	\$0	\$0
Utilities	\$0	\$0	\$0	\$0	\$0
Insurance	\$0	\$0	\$0	\$0	\$0
Taxes (real estate, etc.)	\$0	\$73	\$96	\$119	\$288
Interest		\$0	\$0	\$0	\$0
Other expenses	\$0	\$0	\$0		\$0
SUBTOTAL	\$0	\$18,073	\$35,096	\$52,119	\$105,288
Loan principal payment	\$0	\$0	\$0	\$0	\$0
Capital purchase	\$0	\$0	\$0	\$0	\$0
Other startup costs	\$0	\$0	\$0	\$0	\$0
Reserve and/or Escrow	\$0	\$0	\$0	\$0	\$0
Others withdrawal	\$0	\$15,000	\$30,000	\$45,000	\$90,000
TOTAL CASH PAID OUT	\$0	\$33,073	\$65,096	\$97,119	\$195,288
CASH POSITION	\$0	\$16,927	\$51,831	\$104,712	\$173,470

PROFIT & LOSS

	Year 1	Year 2	Year 3
Sales	\$50,000	\$100,000	\$150,000
Costs/Goods Sold	\$17,000	\$34,000	\$51,000
GROSS PROFIT	\$33,000	\$66,000	\$99,000
OPERATING EXPENSES			
Salary (Office & Overhead)	\$0	\$0	\$0
Payroll (taxes, etc.)	\$1,020	\$2,040	\$3,060
Outside Services	\$0	\$0	\$0
Supplies (office & operation)	\$0	\$0	\$0
Repairs & Maintenance	\$0	\$0	\$0
Advertising	\$1,000	\$1,000	\$1,000
Car, delivery & travel	\$0	\$0	\$0
Accounting & legal	\$0	\$0	\$0
Rent	\$0	\$0	\$0
Telephone	\$0	\$0	\$0
Utilities	\$0	\$0	\$0
Insurance	\$0	\$0	\$0
Taxes (real estate, etc.)	\$0	\$0	\$0
Interest	\$0	\$0	\$0
Depreciation	\$0	\$0	\$0
Other expenses	\$0	\$0	\$0
TOTAL EXPENSES	\$2,020	\$3,040	\$4,060
NET PROFIT (before taxes)			
Income Taxes	\$73	\$73	\$73
NET PROFIT (after tax)	\$30,907	\$62,887	\$94,867
Owner Draw/Dividends	\$25,000	\$50,000	\$75,000
ADJUSTED TO RETAINED	\$5,907	\$12,887	\$19,867

BREAK EVEN ANALYSIS

DIRECT COSTS	Fixed Costs (\$)	Variable Costs (%)
Cost of Goods Sold	\$0	0%
Inventory	\$0	0%
Raw Materials	\$0	0%
Direct Labor	\$17,200	0%
INDIRECT COSTS		
Salaries	\$15,000	
Supplies	\$0	0%
Repairs & Maintenance	\$0	0%
Advertising	\$0	0%
Car, delivery & travel	\$0	0%
Rent	\$0	0%
Telephone	\$0	0%
Utilities	\$0	0%
Insurance	\$0	0%
Taxes	\$288	0%
Interest	\$0	0%
Depreciation	\$0	0%
Other Costs	\$0	0%
TOTAL DIRECT COSTS	\$17,200	0%
TOTAL INDIRECT COSTS	\$15,288	0%
BREAKEVEN SALES LEVEL: \$32,488		

SYSTEM ARCHITECTURE

The prototype RADV tool was developed in Python and currently hosted on the Google App Engine.

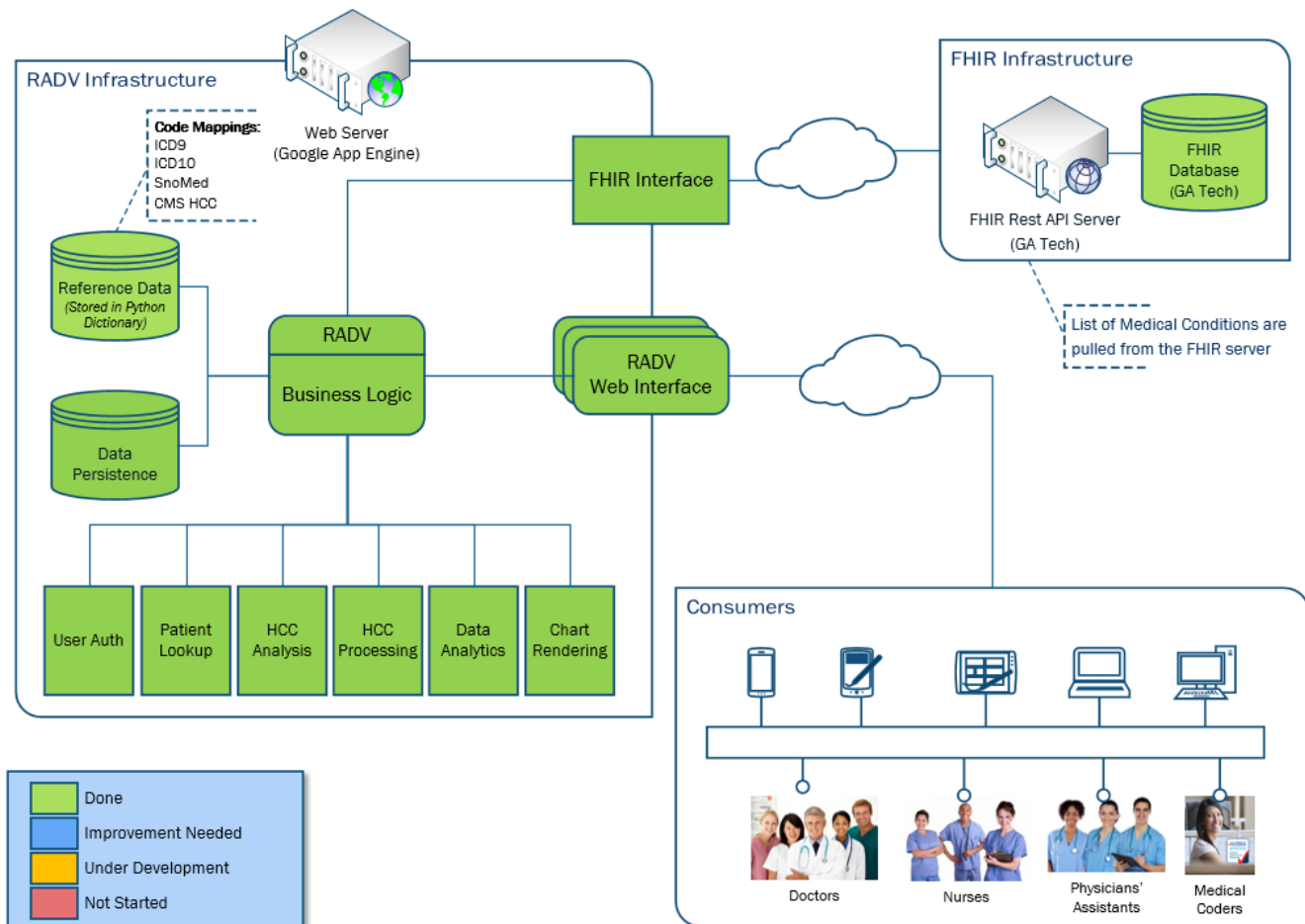


Figure 3

SYSTEM REQUIREMENTS

In order for a user to gain access to the RADV tool they will need a machine with a modern operating system installed (tested on Windows 8, Windows 10, OS X, Ubuntu 16.04, CentOS 7, and Chrome OS) with a modern browser installed (tested on Internet Explorer 11, Safari, Firefox, Chrome, and Microsoft Edge). The minimum specs tested 4 GB of RAM and a dual core 1.70 GHz processor although lower specifications should also work as the client machine does not perform processing in the application.

ON-LINE DEMO

RADV is accessible via <https://focus-appliance-122323.appspot.com/>. It connects to and directly parses the Georgia Institute of Technology's FHIR server. Screenshots are available in the use instructions.

Username: FHIRedUp

Password: PjV7kGTD

ACRONYMS & ABBREVIATIONS

EHR	Electronic Health Record
FHIR	Fast Healthcare Interoperability Resources
HCC	Hierarchical Condition Categories
HIPAA	Health Insurance Portability and Accountability Act of 1996
HL7	Health Level Seven International
ICD (9 & 10)	International Classification of Diseases (9 th & 10 th Editions)
RADV	Risk Adjustment Data Validation
SNOMED	Systematized Nomenclature of Medicine

USER ACCESS LEVELS

In this implementation all users have the same permissions, however, as noted in the "Constraints" section below a real-world implementation would employ role-based access to control functionality and ensure security.

CONSTRAINTS

- A real-world implementation would employ Role-Based Access Control or other permissions and workflows to ensure that a medical doctor confirms all additions or deletions to patient's Electronic Health Record in the FHIR server in addition to complying with HIPAA regulations for privacy and HL7 for security.
- The application server's cache is flushed automatically every 5 minutes to ensure the patient's record is obtained with the most recent information.
- There is a persistence API to store all changes made through RADV. A real world application would add data to the FHIR server itself, making entries on the FHIR server's audit trail.
- There is limited patient data in the FHIR server used. Patients 4 and 725 have entries that demonstrate features of the RADV application.

REPOSITORY

FHIRed_Up uses a private repository on the Georgia Institute of Technology's enterprise GitHub server for collaboration and file storage of the RADV application and documentation.

USING RADV

LOGIN

Using your web browser, navigate to <https://focus-appliance-122323.appspot.com>

The screenshot shows the login interface for the RADV application. At the top, there's a header bar with the word 'Login' on the left and a 'Login' link on the right. Below the header, the word 'RADV' is prominently displayed. Underneath, there's a login form containing two input fields: 'Username' (with placeholder text 'User Name') and 'Password' (with placeholder text 'Password'). Below these fields is a checkbox labeled 'Remember Me'. A blue 'Log In' button is positioned at the bottom of the form. At the very bottom of the page, a small copyright notice reads '© Copyright 2016 by FHIRed Up.'

Figure 4

Login with the username, FHIRedUp, and password, PjV7kGTD.

PATIENT LOOKUP

Once authenticated, the Patient lookup screen (*Figure 5*) should appear. A user can search by patient name or ID by selecting the appropriate radio button. This user guide employs patient 4 for examples.

The screenshot displays the patient lookup interface. The header bar includes 'Patient Lookup' on the left and a 'Logout' link on the right. The main section features the title 'RADV - Risk Adjustment Data Validation Tool'. Below this, there's a 'Home' link. The 'Find Patient' section contains a text input field with the placeholder 'Enter Patient Name or ID' and a blue 'Look Up' button. Underneath the input field, there are two radio buttons: 'Patient Name' (which is selected) and 'Patient ID'. At the bottom, a copyright notice states '© Copyright 2016 by FHIRed Up.'

Figure 5

In *Figure 5*, a user can enter either the patient's name or ID in the search box to find the patient's medical records from the FHIR server.

Patient Lookup
Patient Lookup
Logout

RADV - Risk Adjustment Data Validation Tool

Home

Find Patient
Look Up

☐ Patient Name
☒ Patient ID

Actions	Patient ID	Patient Name	DOB	Gender	Address
View	4	Carter K Adkins	1972-04-13	male	559 Hyannis Circle Atlanta, GA, 30324

Show
entries

Previous
1
Next

© Copyright 2016 by FHIRed Up.

Figure 6

After searching for patient with an ID of 4, the matching patient record appears below the search entry field with a blue hyperlink to view the patient (Figure 6).

On each internal page, the Patient lookup and logout links are displayed in the top left and right corners. Any active links are displayed in blue. Selection buttons are displayed as blue buttons with white text as the look up button above.

PATIENT DISPLAY

To select a patient, click on the view hyperlink. The patient's record displays with their information at the top, their current year's Hierarchical Condition Categories (HCCs) on the left pane, the candidate missing HCCs in the middle panel with each HCC's risk score, the year in which it previously appeared on the patient's EHR, the HCC code, and a link for adding to or rejecting from the patient's EHR. The Risk score information and graphical display appear on the right panel with the ability to see the impact of adding the candidate HCCs. The gauge at the top of the right panel indicates the severity of the patient's candidate risk score relative to their current risk score.

Home / Patient

Name: Carter K Adkins
Patient ID: 4

DOB: 1972-04-13
Gender: male

Address:
559 Hyannis Circle
Atlanta, GA, 30324

Risk Score:
2.214

Figure 7

At the top of the page, the patient's information is always displayed (Figure 7).

Candidate HCCs

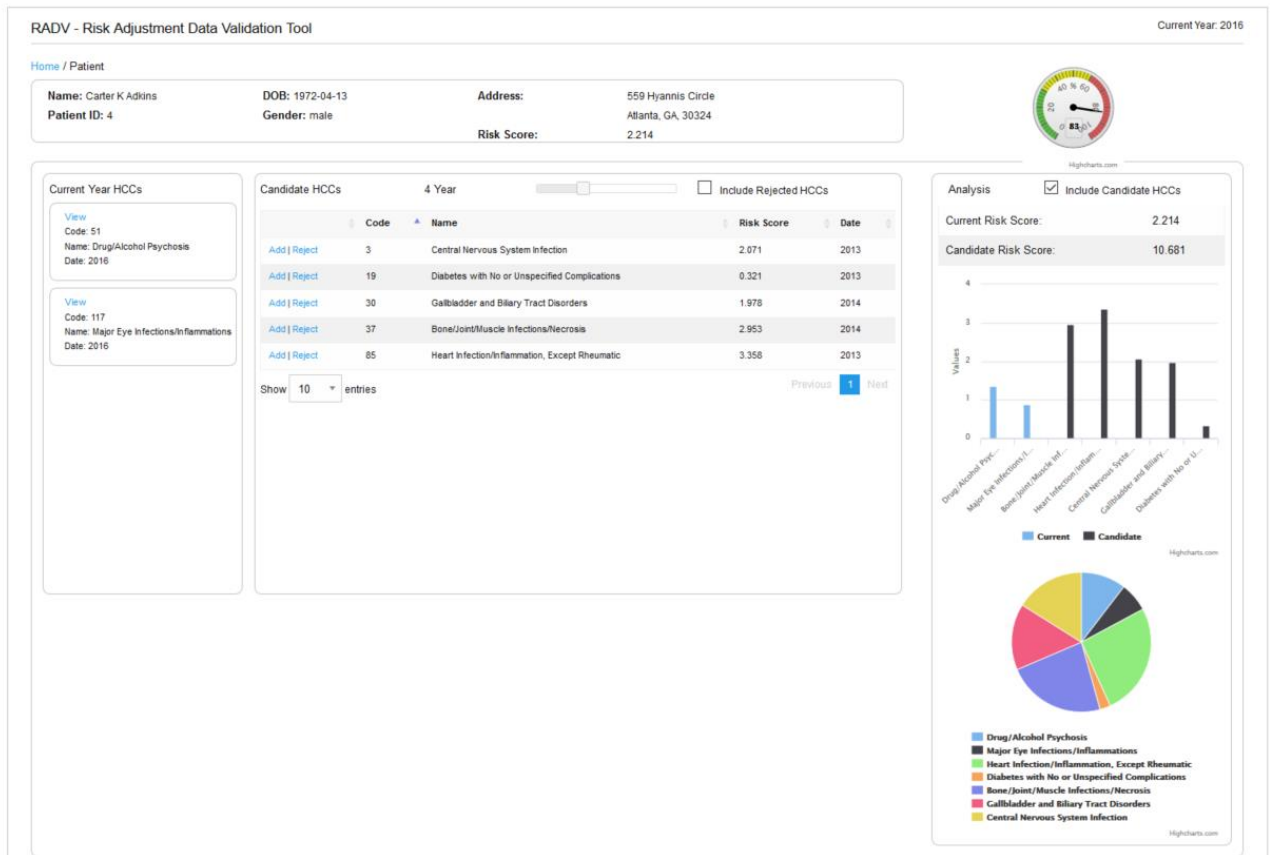


Figure 8

After clicking the view link, the patient's condition record is displayed (Figure 8) and consists of top, left, center and right panels.

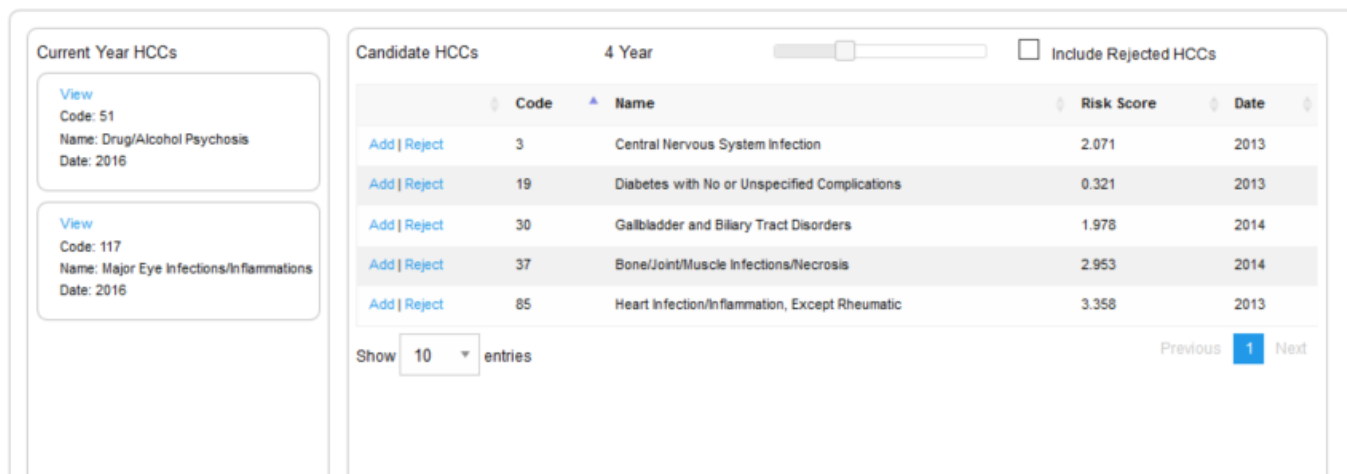


Figure 9

As shown in *Figure 9*, the left panel contains the HCCs from the patient’s medical record for the current year. Additional information including the date, SNOMED code(s) and doctor’s notes are accessible via the “View” link next to each HCC.

The center panel contains a list of candidate (*or missing*) HCCs that were applied to the patient in previous years but not applied during the current year. These candidate HCCs include the applicable risk score and year in which it was last applied to the patient. Links to “Add” or “Reject” a candidate HCC are included.

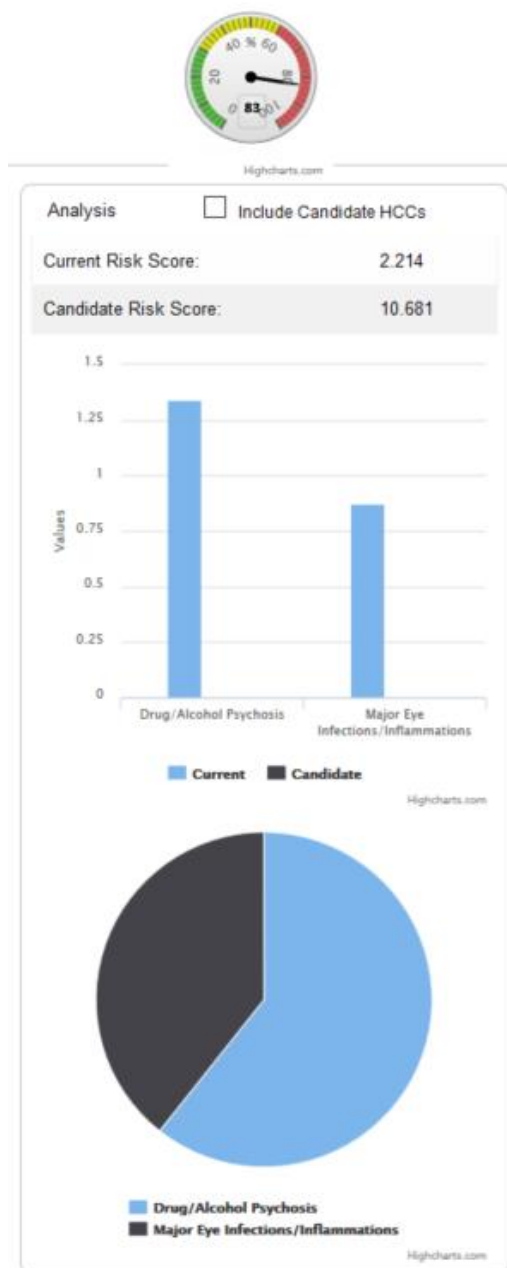


Figure 10

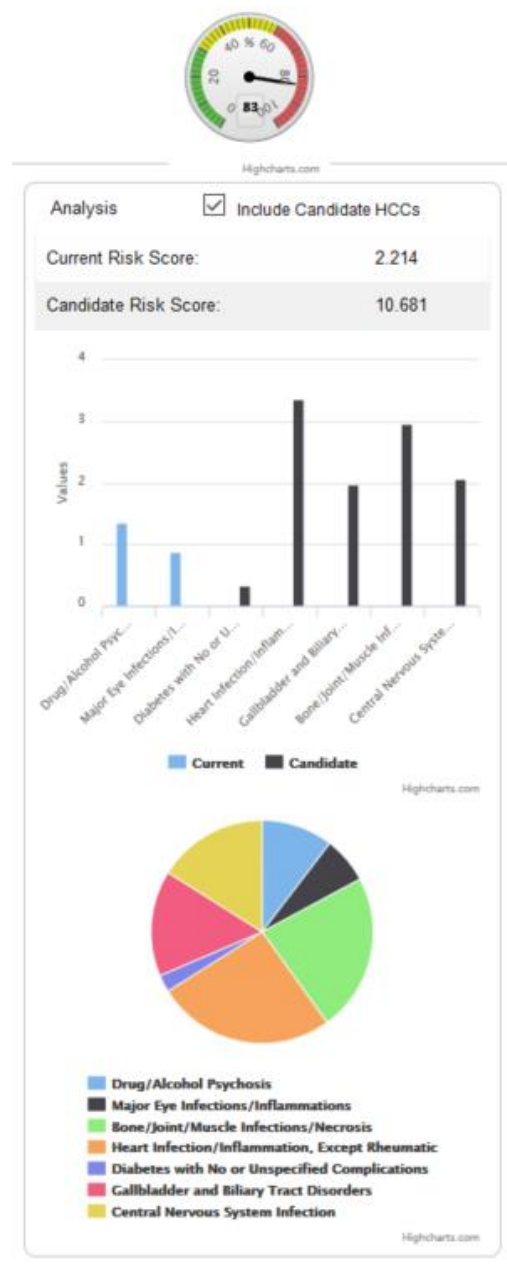


Figure 11

The right panel displays graphical information (Figures 10 & 11) regarding the patient's risk score. Figure 10 shows just the current year HCCs, while Figure 11 (with the "Include Candidate HCCs" option selected) shows both the current and candidate HCCs.

CANDIDATE RISK SCORE METER

The candidate risk score meter (or gauge) (*Figure 12*) indicates the severity of the patient's candidate risk score relative to their current risk score. It is used to quickly identify if a patient's candidate HCCs would make a significant impact to their current risk score if they were added to the patient.

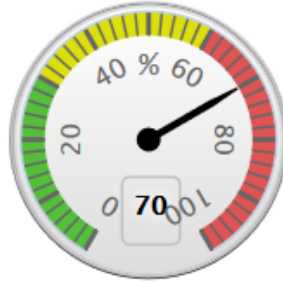


Figure 12

Candidate Risk Score Meter

The formula for calculating this metric is:

$$x\% = \left(1 - \frac{\text{Current Risk Score}}{\text{Sum (Candidate HCC Risk Scores) + Current Risk Score}}\right) * 100\%$$

Example:

If a patient has a Current Risk Score of 0.723 and the sum of their Candidate Risk Scores is 1.687, the candidate risk score meter would register 70, indicating the patient's current risk score is 70% less than what it would be if candidate HCCs were included.

$$70\% = \left(1 - \frac{0.723}{1.687 + 0.723}\right) * 100\%$$

VIEWING CURRENT YEAR HCCS

To view information on a current year HCC, click on the View link for a particular condition (*Figure 13*).

Current Year HCCs

[View](#)
Code: 51
Name: Drug/Alcohol Psychosis
Date: 2016

[View](#)
Code: 117
Name: Major Eye Infections/Inflammations
Date: 2016

Figure 13

A new window will open (*Figure 14*) displaying the Code's verification status for that patient, the related SNOMED codes which were entered and translated to that HCC, and any notes entered by the doctor.

View Hcc 51 - Drug/Alcohol Psychosis

Verification Status: Confirm

Notes:

SnowMed Codes: (Select All that Apply)

<input type="checkbox"/>	Code	Name
<input checked="" type="checkbox"/>	10028000	Drug/Alcohol Psychosis
<input type="checkbox"/>	10327003	Drug/Alcohol Psychosis
<input type="checkbox"/>	11061003	Drug/Alcohol Psychosis
<input type="checkbox"/>	111480006	Drug/Alcohol Psychosis
<input type="checkbox"/>	11387009	Drug/Alcohol Psychosis
<input type="checkbox"/>	12380008	Drug/Alcohol Psychosis
<input type="checkbox"/>	135311000119100	Drug/Alcohol Psychosis
<input type="checkbox"/>	1383008	Drug/Alcohol Psychosis
<input type="checkbox"/>	1461000119109	Drug/Alcohol Psychosis
<input type="checkbox"/>	1471000119103	Drug/Alcohol Psychosis

save delete Cancel

Figure 14

A user may delete this entry, but we advise that in a real-world implementation, only a doctor may perform this action while making supporting documentation.

VIEWING CANDIDATE HCCS

The center panel (Figure 15) displays candidate HCCs that were entered on the patient’s EHR in previous years but not yet added or rejected during the current year. By default, the application will display candidate HCCs from the past four years, and a user may adjust the time by sliding the bar at the top of the panel.

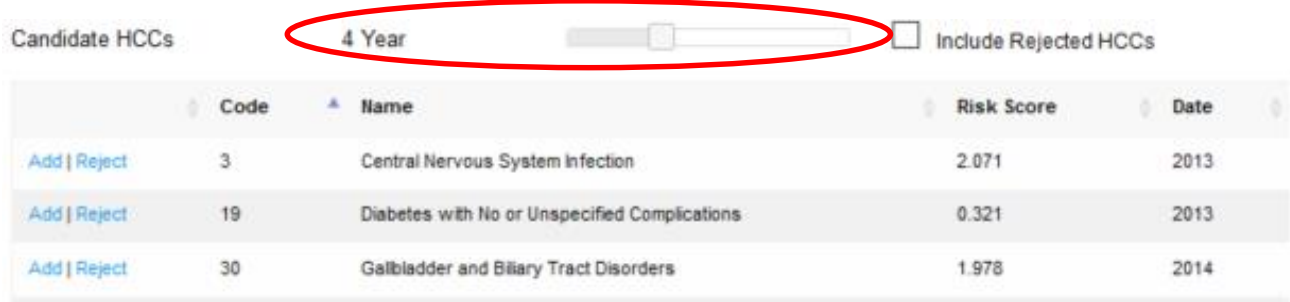


Figure 15

ADDING AN HCC

To add an HCC to a patient’s EHR, select the add link to the left of the specific HCC (Figure 16).

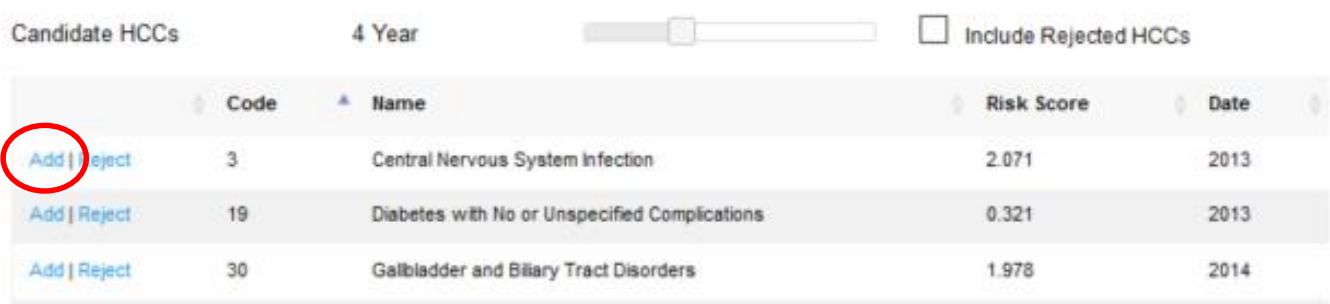


Figure 16

A new window will open (Figure 17) allowing the user to select corresponding SNOMED codes, the verification status (which should be “Confirm” by default), and enter any supporting reasons.

Add Hcc 3 - Central Nervous System Infection

Verification Status

Confirm

SnowMed Codes:

(Select All that Apply)

<input type="checkbox"/>	Code	Name
<input type="checkbox"/>	10082001	Central Nervous System Infection
<input type="checkbox"/>	10491005	Central Nervous System Infection
<input type="checkbox"/>	106016005	Central Nervous System Infection
<input type="checkbox"/>	109902004	Central Nervous System Infection
<input type="checkbox"/>	109903009	Central Nervous System Infection
<input type="checkbox"/>	110269000	Central Nervous System Infection
<input type="checkbox"/>	111850006	Central Nervous System Infection
<input type="checkbox"/>	111865007	Central Nervous System Infection
<input type="checkbox"/>	111868009	Central Nervous System Infection
<input type="checkbox"/>	111872008	Central Nervous System Infection

Notes:

Add

Cancel

Figure 17

Once a candidate HCC has been added, the graphical display on the right panel will automatically update showing the current HCCs in blue and candidate HCCs in black (Figures 18 & 19). The pie chart displays the percentage each HCC contributes to the total. To display the percentage, hover over the pie slice.

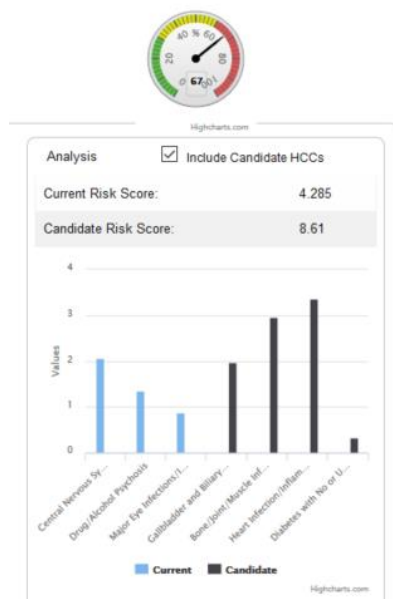


Figure 18

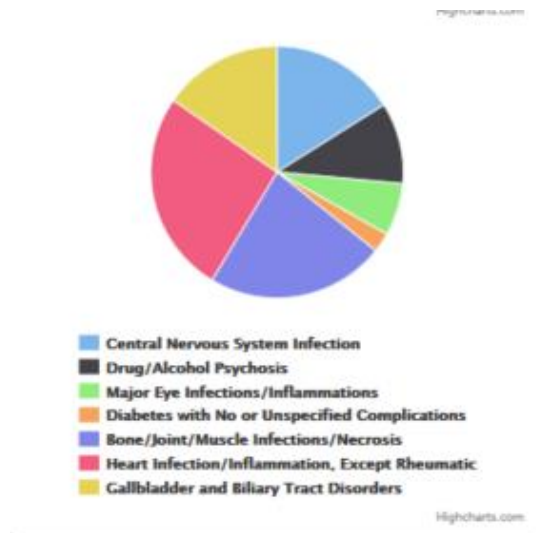


Figure 19

REJECTING HCCS

A user may also reject HCCs which are not accurate or no longer affect the patient although they appear in their EHR for previous years. The user has the option of displaying HCCs which have already been rejected that year in case there was an error.

To reject, a user clicks on the reject link to the left of the HCC (*Figure 20*).

Candidate HCCs 4 Year ☐ Include Rejected HCCs

	Code	Name	Risk Score	Date
Add Reject	3	Central Nervous System Infection	2.071	2013
Add Reject	19	Diabetes with No or Unspecified Complications	0.321	2013
Add Reject	30	Gallbladder and Biliary Tract Disorders	1.978	2014
Add Reject	37	Bone/Joint/Muscle Infections/Necrosis	2.953	2014
Add Reject	85	Heart Infection/Inflammation, Except Rheumatic	3.358	2013

Previous [1](#) Next

Figure 20

A new window opens with showing corresponding SNOMED codes, a default verification status of “Refuted”, and a free text field for notes (*Figure 21*).

Reject Hcc 30 - Gallbladder and Biliary Tract Disorders

Verification Status
Refuted

SnowMed Codes: (Select All that Apply)

Code	Name
<input type="checkbox"/> 10184002	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 105997008	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 110995008	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 111372003	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 111373008	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 118926004	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 125661000119107	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 12932003	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 129587006	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/> 134402008	Gallbladder and Biliary Tract Disorders

Notes:

Reject Cancel

Figure 21

To complete rejection, enter notes and select reject (Figure 22).

Reject Hcc 30 - Gallbladder and Biliary Tract Disorders

Verification Status: Refuted

SnowMed Codes: (Select All that Apply)

<input type="checkbox"/>	Code	Name
<input type="checkbox"/>	10184002	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	105997008	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	110995008	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	111372003	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	111373008	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	118926004	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	125661000119107	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	12932003	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	129587006	Gallbladder and Biliary Tract Disorders
<input type="checkbox"/>	134402008	Gallbladder and Biliary Tract Disorders

Notes: For demonstration purposes. |

Reject Cancel

Figure 22

The HCC no longer appears in the candidate HCC list unless “Include Rejected HCCs” is selected.

The graphs at the right are updated as well.

The images show the graphical display after rejecting an HCC.

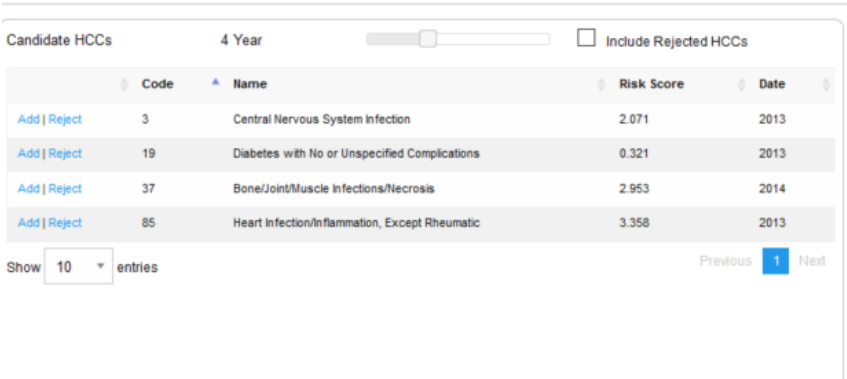


Figure 23

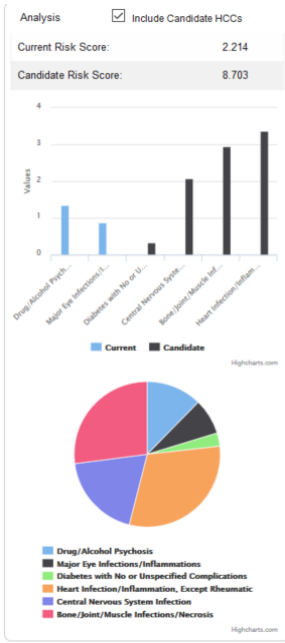


Figure 24

The images show the graphical display after rejecting an HCC and selecting include rejected HCCs.

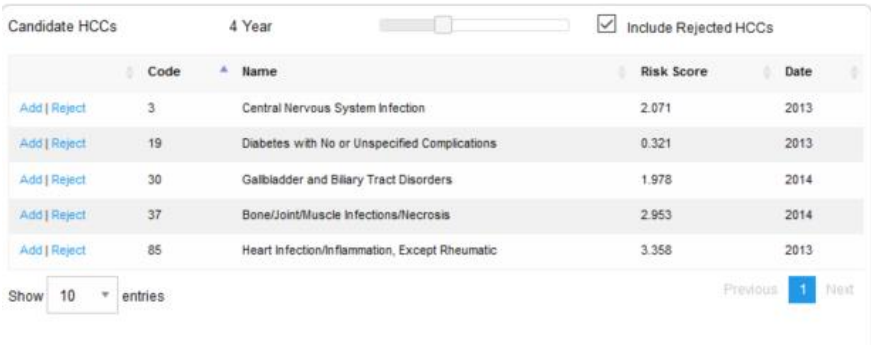


Figure 25

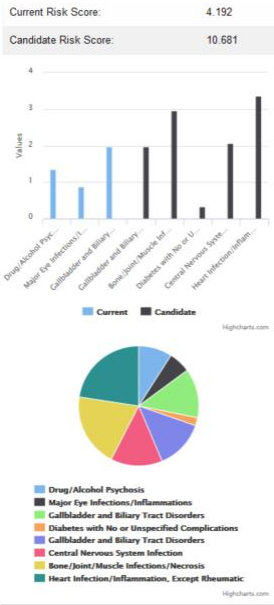


Figure 26

LOOK UP ANOTHER PATIENT

To look up another patient click the blue hyperlink in the top left of the window labelled “Patient Lookup”. This will return the user to the patient lookup screen.

LOGOUT

To logout, click the blue “logout” hyperlink in the top right of the screen.

DATA RECORDING

All data entries are recorded via a persistence API without additional steps from the user. As stated in constraints, a real world implementation would make changes on the FHIR server under the current encounter and be recorded in the FHIR server’s audit trail.

FUTURE IMPROVEMENTS

Some candidate features identified for the RADV tool include:

1. A reporting tool listing patients with a high “candidate” HCC risk score. This would help providers identify high risk patients with past medical conditions not yet recorded for the current calendar year.
2. Allowing the selection of individual Candidate HCCs (instead of “all” Candidate HCCs listed) to review the net impact this subset would have on the patient’s calculated risk score.
3. Role-based access to control to determine which users can view, add, update and reject HCCs.
4. Integration with other medical systems.

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<http://kff.org/health-reform/issue-brief/explaining-health-care-reform-risk-adjustment-reinsurance-and-risk-corridors/>

Images from:

<http://decompressionprosmarketing.com/blogs/decompression-pros/16891112-how-to-ask-for-referrals-from-medical-doctors>

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<http://allhealthcare.monster.com/training/articles/1822-5-steps-to-becoming-a-medical-assistant>

http://greenfieldcc.3dcartstores.com/Medical-Coding-and-Billing_p_1058.html

Graphing Tools:

Highcharts (<http://www.highcharts.com/>)