Documentation

- www.va.gov/vdl
- Clinical Reminders Manager's Manual
Questions

• Clinrem.questions@gmail.com
Major Pieces of Reminder Functionality

- Reminder Definitions
- Reminder Dialogs
- Reminder Reports
- Reminder Patient Lists and Extracts
- Reminder Exchange
Class Design

● Learn about functionality – live demos
● Do homework
● Review homework and answer questions
● Continue until we have covered it all
Reminder Definitions

- What are reminders used for?
  - Patient care
  - Reporting (Performance Measures)

- What are the main ingredients?
  - List of patient data types (findings)
  - Patient cohort logic
  - Resolution logic
First Step – Write a Description

- Sample descriptions
  - Applicable to all patients age 50 and older and is resolved by an influenza immunization.
  - Applicable to any patient who has a diabetes diagnosis and is resolved by the patient having a yearly hemoglobin A1C completed with results.
Two Boolean Logic Strings

• Patient Cohort Logic – defines who the reminder applies to
• Resolution Logic – defines what resolves the reminder
• Built using patient data called findings
Baseline Frequency and Age Range Sets

• Frequency – how often the reminder needs to be done
• Age range the frequency applies to
• Examples
  • 40-50 2Y
  • 51-65 6M
  • 66-70 3Y
Sex Specific

- Female – F
- Male – M
- Not sex specific – leave blank
Findings Multiple

^PXD(811.9,D0,20,D1,0)= (#.01) FINDING ITEM [1V] ^ (#1) MINIMUM AGE [2N] ^

[4F]  
[7S]  ^  
RESOLUTION  
[7S]  ^  
INACTIVE  
[12N]  ^  
[14N]  ^  
DATA

==>(#2) MAXIMUM AGE [3N] ^ (#3) REMINDER FREQUENCY
==>(#6) RANK FREQUENCY [5N] ^ (#7) USE IN
==>(#8) USE IN PATIENT COHORT LOGIC
==>(#9) BEGINNING DATE/TIME [8F] ^ (#10) USE
==>(#11) WITHIN CATEGORY RANK [10N]
==>(#16) RXTYPE [13F] ^ (#17) OCCURRENCE COUNT
==>(#27) USE START DATE [15S] ^ (#28) INCLUDE VISIT
==>[16S]  ^
# Findings

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<tr>
<th>FILE NUMBER</th>
<th>PREFIX</th>
<th>NAME</th>
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<tr>
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<td>DRUG</td>
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<td>EXAM</td>
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</tr>
<tr>
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<td>LT</td>
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<tr>
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<td>MH</td>
<td>MH TESTS AND SURVEYS</td>
</tr>
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<td>OI</td>
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<tr>
<td>71</td>
<td>RP</td>
<td>RADIOLOGY PROCEDURE</td>
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<td>CF</td>
<td>REMINDER COMPUTED FINDING</td>
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<td>TX</td>
<td>REMINDER TAXONOMY</td>
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<td>811.5</td>
<td>RT</td>
<td>REMINDER TERM</td>
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<tr>
<td>9999999.28</td>
<td>ST</td>
<td>SKIN TEST</td>
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<tr>
<td>50.605</td>
<td>DC</td>
<td>VA DRUG CLASS</td>
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<td>50.6</td>
<td>DG</td>
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<td>120.51</td>
<td>VM</td>
<td>VITAL MEASUREMENT</td>
</tr>
<tr>
<td>810.9</td>
<td>RL</td>
<td>REMINDER LOCATION LIST</td>
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</table>
Finding Modifiers

- Modify how a finding is used
- Some apply to all findings
- Some apply to specific finding types
Frequency Age Range Set

- Reminder Frequency
- Minimum Age
- Maximum Age
- Rank Frequency
Logic

- Use in Patient Cohort Logic
- Use in Resolution Logic
- OR = !
- AND = &
- NOT = '
Date Range

• Beginning Date/Time
• Ending Date/Time
• Any valid FileMan date
• Examples:
  • T-3M, T-1Y, T+3D
Occurrence Count

- The number of occurrences to search for in the date range
- Default is the last occurrence
- \( I \ N > 0 \)
  - Up to \( N \) most recent occurrences
- \( I \ N < 0 \)
  - Up to \( N \) oldest occurrences
Finding Specific Modifiers

- Use Inactive Problems
  - Taxonomies – Problem List
- Within Category Rank
  - Health Factors
- MH Scale
  - Mental Health Test
Finding Specific Modifiers

Drug Findings

• RX Type
  • Inpatient, outpatient, non-VA

• Use Start Date
  • Date of finding is start date instead of default stop date
  • Also applies to orderable items
Finding Specific Modifiers
PCE (V File) Findings

• Include Visit Data
• When YES makes the following data available
  • Visit IEN, Date visit created, DFN
  • Location of Encounter, Station Number
  • Service Category, DSS ID, Outside Location
  • Status, Primary provider
Conditions

• Test finding data values in the form of an If statement

• Default is V
  • I V>3.0

• Also have “CSUB” (Condition Subscript)
  • I V("CSUB")=4

• Can see all available CSUBs in Reminder Test

• Condition Case Sensitive
PXRM Managers Menu

CF     Reminder Computed Finding Management ...
RM     Reminder Definition Management ...
SM     Reminder Sponsor Management ...
TXM    Reminder Taxonomy Management ...
TRM    Reminder Term Management ...
LM     Reminder Location List Management ...
RX     Reminder Exchange
RT     Reminder Test
OS     Other Supporting Menus ...
INFO   Reminder Information Only Menu ...
DM     Reminder Dialog Management ...
CP     CPRS Reminder Configuration ...
RP     Reminder Reports ...
MST    Reminders MST Synchronization Management ...
PL     Reminder Patient List Menu ...
PAR    Reminder Parameters ...
ROI    Reminder Orderable Item Group Menu ...
XM     Reminder Extract Menu ...
GEC    GEC Referral Report
RRT    User Report Templates
Setup A Simple Reminder

- Everyone 50 and older should get an annual flu shot.
Create A Reminder Definition

- Reminder Definition Management
  - RL List Reminder Definitions
  - RI Inquire about Reminder Definition
  - RE Add/Edit Reminder Definition
  - RC Copy Reminder Definition
  - RA Activate/Inactivate Reminders
  - RH Reminder Edit History
Reminder Test

CF     Reminder Computed Finding Management ...
RM     Reminder Definition Management ...
SM     Reminder Sponsor Management ...
TXM    Reminder Taxonomy Management ...
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XM     Reminder Extract Menu ...
GEC    GEC Referral Report
Important - Validate Reminder Before Deploying It

• If the reminder logic is incorrect
  • Users will not trust it
  • Users will not trust you
Testing a Reminder Definition

• Test all possibilities
  • Applicable
  • Not applicable
  • Resolved
  • Not resolved
Testing the Simple Flu Reminder

• Patient under 50 – N/A
  • DFN=100935

• Patient over 50 – Applicable
  • DFN=100100

• Patient over 50 with past immunization
  • DFN=100033

• Patient over 50 with no past immunization
  • DFN=100100
Finding Specific Modifiers
Health Factors

• Health Factor Toggling – Only most recent health factor in a category is true

• Within Category Rank
  • Rank Health Factors that have identical date/time
  • Special Value of 0 turns off toggling
More Complex Reminder

• Everyone 50 and older should get a flu shot once a year.
• Anyone at high risk should get a flu shot regardless of age.
Reminder Taxonomy

• Give a name to a set of codes
  • VA-DIABETES

• Types of codes than can be used:
  • ICD Operation/procedure (ICD 0)
  • ICD Diagnosis (ICD 9)
  • CPT
Creating a Taxonomy

• If you are not a coding expert get help

• Reminder Taxonomy Management
  • TL  List Taxonomy Definitions
  • TI  Inquire about Taxonomy Item
  • TE  Add/Edit Reminder Taxonomy
  • TC  Copy Taxonomy Item
  • TX  Selected Taxonomy Expansion
  • TXV Verify all taxonomy expansions
  • TXA Expand all Taxonomies
Diabetes Taxonomy

- ICD 9 codes
  - Low code – 250.00
  - High code – 250.90
Modify Flu Shot Reminder

- Add diabetes taxonomy as a finding
- Use it to override baseline frequency/age range
  - No minimum age
  - No maximum age
- Find a patient and test (SEVEN, PATIENT)
Reminder Term

• A way to group findings that mean the same thing

• Example
  • Lab test
  • Health factor for test done outside
Example of Reminder Term

- Mapped findings for influenza immunization
- Immunizations
  - INFLUENZA
  - INFLUENZA B
  - FLU,3 YRS
- Health Factor
  - OUTSIDE INFLUENZA IMMUNIZATION
Term Findings

• Any finding that can be used in a definition
• Except a reminder term
Term Evaluation

• Term takes on the value of the most recent true mapped finding
• This means, if there is a true mapped finding term will be true
• Unless a Condition makes the most recent finding false
Creating a Term

• Reminder Term Management
  • TL  List Reminder Terms
  • TI  Inquire about Reminder Term
  • TE  Add/Edit Reminder Term
  • TC  Copy Reminder Term
Custom Logic

- Used when simple logic is not sufficient
  - Customized Patient Cohort Logic
  - Customized Resolution Logic
Boolean Logic and MUMPS

• For Clinical Reminder findings
  • 1 is true
  • 0 is false
• ! is the OR operator
• & is the AND operator
• ' is the NOT operator
Evaluation Rules

- $0 \& 0 = 0$
- $1 \& 0 = 0$
- $1 \& 1 = 1$
- $0 ! 0 = 0$
- $0 ! 0 = 0$
- $1 ! 0 = 1$
- $'0 = 1$
- $'1 = 0$
MUMPS Logic Evaluation

- No operator precedence
- Evaluation from left to right
- Expressions in parenthesis are evaluated first
Customized Logic Example

• \( FI(7)! (FI(11) \& FI(9) \& FI(10)) \)

• Will be true when
  
  • \( FI(7) \) is true
  
  • Or when \( FI(9), FI(10), \) and \( FI(11) \) are all true
Term Example - Influenza Immunization

- Mapped Findings
  - IM.INFLUENZA
  - IM.INFLUENZA B
  - IM.INFLUENZA FLU,3 YRS
  - HF.OUTSIDE INFLUENZA IMMUNIZATION
Creating a Term

- Reminder Term Management
  - TL  List Reminder Terms
  - TI  Inquire about Reminder Term
  - TE  Add/Edit Reminder Term
  - TC  Copy Reminder Term
Term Inheritance

• Finding modifiers can be inherited from the definition

• Makes sense sometimes
  • When all mapped findings are the same type
  • Some modifiers such as beginning date/time and ending date/time
Function Findings

• Computations on the data of regular findings
• Same uses as regular findings
• Except
  • Function findings do not have a date
  • Cannot be used as the sole means of resolving a reminder
Function Strings Are Built Using

• Functions
• Operators
• Numbers
• Text
Functions

• COUNT
• DIFF_DATE
• DUR
• FI
• MAX_DATE
• MIN_DATE
• MRD
• NUMERIC
• VALUE
Operators That Can Be Used in a Function String

- **Logical**
  - ! & '
- **Mathematical**
  - + - < > =
- **String**
  - = ] [
Function String Examples

• MRD(1) > MRD(2)
• COUNT(2) > 3
• DIFF_DATE(1, 3) > 45
• DUR(2) > 20
• VALUE(4, 1, "VALUE") < VALUE(4, 2, "VALUE")
• MRD(9, 20) > MRD(2)!'(FI(2)!FI(19))
• MRD(7, 12, 13, 14, 15) > MRD(2)!
  (DIFF_DATE(7, 2) < 120)! (DIFF_DATE(12, 2) < 120)
Creating a Function Finding

Select Reminder Definition: AJM AGE LOCAL

Select one of the following:

A  All reminder details
G  General
B  Baseline Frequency
F  Findings
FF Function Findings
L  Logic
C  Custom date due
D  Reminder Dialog
W  Web Addresses

Select section to edit:

Select Reminder Definition: FF
Creating a Function Finding

Function Findings
Select FUNCTION FINDING: 1
   Are you adding '1' as a new FUNCTION FINDINGS (the 1ST for this REMINDER DEFINITION)? No// Y (Yes)
   FUNCTION FINDINGS FUNCTION STRING: MRD(1)<MRD(2)
FUNCTION FINDING NUMBER: 1//
FUNCTION STRING: MRD(1)<MRD(2)//
FOUND TEXT:
   No existing text
   Edit? NO//
NOT FOUND TEXT:
   No existing text
   Edit? NO//
USE IN RESOLUTION LOGIC:
USE IN PATIENT COHORT LOGIC:
REMINDER FREQUENCY:
MINIMUM AGE:
MAXIMUM AGE:
RANK FREQUENCY:
Computed Findings

• Clinical Reminder plugins
• Must be a programmer to create them
• Anyone can use them
• More than 40 national computed findings
Computed Findings Types

- Single – kept for compatibility
- Multiple – newer and more versatile
- List – used for patient list building (add operation)
Computed Finding Components

• MUMPS routine
  • Specifications in Clinical Reminder Managers Manual
• Entry in file #811.4
• Description – is online help
Reminder Index

• Basis for efficient reminder evaluation
• Updated whenever patient data is stored, edited, or deleted
• Does not store patient data

• Stores
  • Patient, Item, Date/time, Data Location
  • Item, Patient, Date/time, Data Location
There Are Problems When You Get A Message Like

- Index for file number XXX does not exist or is not complete.
Reminder Index Management

- IB  Clinical Reminders Index Build
- IC  Clinical Reminders Index Count
Clinical Reminders Index Build

Which indexes do you want to (re)build?

1 - LABORATORY TEST (CH, Anatomic Path, Micro)
2 - MENTAL HEALTH
3 - MENTAL HEALTH (MHA3)
4 - ORDER
5 - PTF
6 - PHARMACY PATIENT
7 - PRESCRIPTION
Index Build Continued

8 - PROBLEM LIST
9 - RADIOLOGY
10 - V CPT
11 - V EXAM
12 - V HEALTH FACTORS
13 - V IMMUNIZATION
14 - V PATIENT ED
15 - V POV
16 - V SKIN TEST
Clinical Reminder Parameters File #800

- \(^\text{PXRM}(800, D0, \text{FULL SSN}) = (#6) \text{FULL SSN [1S]} ^\)
- \(^\text{PXRM}(800, D0, \text{MGFE}) = (#3) \text{REMINDER MANAGEMENT MAILGROUP [1P:3.8]} ^\)
- \(^\text{PXRM}(800, D0, \text{MH}) = (#17) \text{MAXIMUM NUMBER OF MH QUESTIONS [1N]} ^\)
- \(^\text{PXRM}(800, D0, \text{MIERR}) = (#15) \text{MAXIMUM NUMBER OF INDEX ERRORS [1N]} ^\)
Homework

• clinrem.homework@gmail.com
Homework – Create a Reminder You Are Interested In

- Write the description
- Create the definition
- Reminder inquiry
- Reminder test