



WorldVistA Presentation - CPRS Lab Display Project and VistA Class III Programming Hooks

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Pharmacy Benefits Management

Pharmacy
VA INFORMATICS



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HEALTH
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in the 21st Century

From the SPECIFIC to the GENERAL...

- Part 1 – Demonstration of “CPRS Lab Display Project”
- Part 2 – Discussion of programming “Hooks” for adding modular functionality to VistA

WARFARIN (GOLDEN STATE) TAB

Change

ORDER REQUIRES INDICATION FOR USE

Dosage	Complex	Route	Schedule (Day-Of-Week)	
		PO/ORAL	Q2100	<input type="checkbox"/> PRN
1MG	0.0273	PO/ORAL	Q12HRS	▲
2MG	0.0278		Q1300	
2.5MG	0.0289		Q1400	
3MG	0.0309		Q14DAY	
4MG	0.0291		Q1500	
5MG	0.0282		Q1800	
7.5MG	0.0336		Q1900	
10MG	0.034		Q1HRS	
			Q2100	
			Q21DAYS	
			Q24HRS	
			Q28DAYS	
			Q2HRS	
			Q3D	
			Q3HRS	
			Q48HRS	▼

Comments:

☐ Give additional dose now

Priority

ROUTINE ▼



LAST INR: 1.27 (Jan 16, 2014@04:00:03)
REFERENCE RANGE: 0.9 - 1.1

WARFARIN (GOLDEN STATE) TAB
PO Q2100

Accept Order

Quit

WARFARIN (GOLDEN STATE) TAB

Change

ORDER REQUIRES INDICATION FOR USE

Dosage	Complex	Route	Schedule (Day-Of-Week)	
5MG	0.0282	PO/ORAL	Q2100	<input type="checkbox"/> PRN
1MG	0.0273	PO/ORAL	Q12HRS	
2MG	0.0278		Q1300	
2.5MG	0.0289		Q1400	
3MG	0.0309		Q14DAY	
4MG	0.0291		Q1500	
5MG	0.0282		Q1800	
7.5MG	0.0336		Q1900	
10MG	0.034		Q1HRS	
			Q2100	
			Q21DAYS	
			Q24HRS	
			Q28DAYS	
			Q2HRS	
			Q3D	
			Q3HRS	
			Q48HRS	

Comments: for atrial fibrillation

☐ Give additional dose now

Priority

Admin. Time: 21

ROUTINE

Expected First Dose: TODAY (Jan 16, 14) at 21:00



High Alert Drug Baseline CBC & INR required before the first dose.

WARFARIN (GOLDEN STATE) TAB
5MG PO Q2100 for atrial fibrillation

Accept Order

Quit

METFORMIN TAB,ORAL

Change

Display Restrictions/Guidelines

Dosage	Complex	Route	Schedule (Day-Of-Week)
		PO/ORAL	<input type="checkbox"/> PRN
500MG	0.0269	PO/ORAL	1600
850MG	0.0385		1700
1000MG	0.0538		2XWEEKLY
1700MG	0.077		3XWEEKLY
			3XWK(OUTPATIENT)
			5XDAY
			6XD
			AC
			AC&BEDTIME
			AM
			AS DIRECTED
			BEDTIME
			BID
			BID (Q12H)
			BID&BEDTIME

Comments:

☐ Give additional dose now

Priority

ROUTINE



LAST CREATININE: 0.764 mg/dL (Jan 16, 2014@04:00)
REFERENCE RANGE: .67 - 1.17 mg/dL
Calculated Creatinine Clearance: 68.3 mL/min

METFORMIN TAB,ORAL
PO

Accept Order

Quit

Setup Process (Captures shortened to show only key fields)

Select Option: ^**DRUG ENTER/Edit**

Select DRUG GENERIC NAME: **WARFARIN**

CHOOSE 1-10: **7** WARFARIN (COUMADIN) NA 5MG TAB BL110

MARK THIS DRUG AND EDIT IT FOR: **O - Outpatient**

** You are NOW editing OUTPATIENT fields. **

AN Outpatient Pharmacy ITEM? **Yes//** (Yes)

MESSAGE: *High Alert Drug* Baseline CBC & INR required before the first dose.

Uses LAB MONITOR setup from Action Profile

Do you wish to mark/unmark as a LAB MONITOR or CLOZAPINE DRUG? **YES**

Mark/Unmark for Lab Monitor or Clozapine:

Select one of the following:

L LAB MONITOR

C CLOZAPINE

Enter response: **LAB MONITOR**

**** You are NOW editing LAB MONITOR fields. ****

Select LAB TEST MONITOR: **INR//**

Now editing:

LAB TEST MONITOR: **INR//**

SPECIMEN TYPE: **PLASMA//**

MONITOR MAX DAYS: **365//**

Code Changes to Class 1 Routine – The “Hook”

```
ORWDPS2 ; SLC/KCM/JLI - Pharmacy Calls for Windows Dialog;05/09/2007  
;;3.0;ORDER ENTRY/RESULTS REPORTING;**85,116,125,131,132,148,  
141,195,215,258,243**;Dec 17, 1997;Build 242  
;
```

```
OIMSG ; from OISLCT, get the orderable item message for this medication  
S I=0 F S I=$0(^ORD(101.43,OI,8,I)) Q:I'>0 S ILST=ILST+1,LST(ILST)="t"^(I,0)  
I $L($T(SL^AJEY0110)) D SL^AJEY0110 ;PBM/RMS 12-1-08  
Q
```

Note: only the relevant linetag/section is displayed here...

So what is in ^AJEY0110?

- In summary...
 - Check parameter for module enabled/disabled status
 - Find the patient
 - Find the PHARMACY ORDERABLE ITEM corresponding to the [CPRS] order's ORDERABLE ITEM
 - Find the Lab Monitor Test associated with the first DRUG in that Pharmacy Orderable Item
 - Calculate the patient's last result of that lab test for the identified specimen type within the designated number of look-back days
 - Add the information to the array that fills the info-box for an orderable item (previously seen in lab test ordering, not medication ordering)
 - Show the lab test reference range
 - If the lab test is CREATININE, also calculate a Cockcroft-Gault Creatinine Clearance [see later slide for AJEY0115]

Tell me about the lab result calculation...

- Within AJEY0110, there is a customized call to Class 1 Lab API RR^LR7OR1 (ICR #2503 although not documented as such in the current version)
- This differs from the Action Profile method which uses ICR #844 for direct access to the ^LR global for lab results

Creatinine Clearance is calculated by AJEY0115

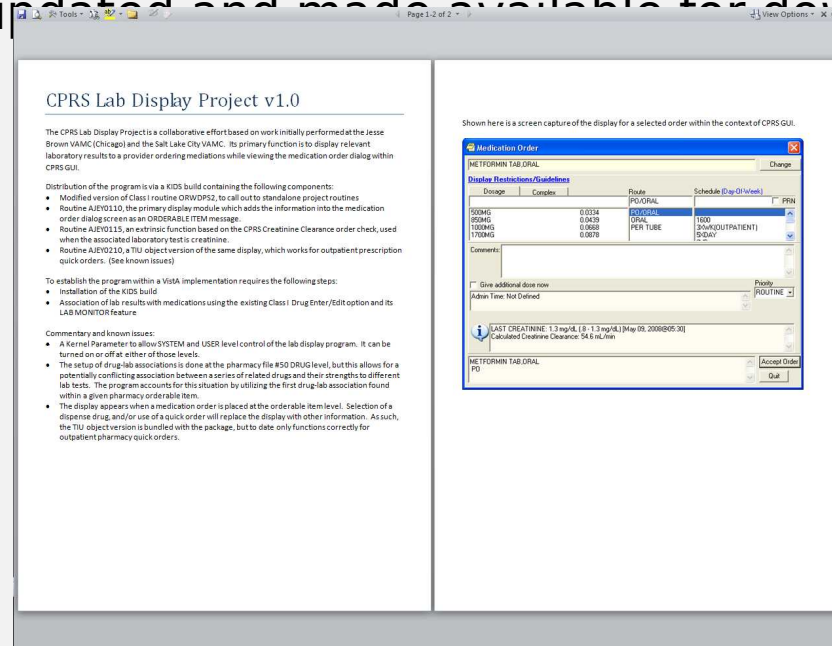
- Basically a copy of the Order Check Expert System routine that performs the same calculation [see OCXOZ0A or similar ... those are compiled routines]
- Standalone routine used to provide exportability and single function
- Rules used by the CPRS Calculation
 - Use Actual Body Weight if lower than Ideal Body Weight
 - Use Ideal Body Weight if lower than Actual Body Weight ... except...
 - If Actual Body Weight exceeds Ideal Body Weight by more than 30%, calculate an Adjusted Body Weight of $IBW + 30\%$ of the difference between IBW and ABW
 - Then use Cockcroft-Gault calculation method to derive CrCl.

FOIA Request

- Dr. Anthracite placed a FOIA Request for the code on December 12, 2013
- The request was fulfilled with delivery of a KIDS build including the code shown in this presentation on January 13, 2014
- Upon successful testing in a non-VA environment, the code will be placed on a publically accessible server for downloads
- *Full disclosure: the detailed review for this presentation pointed out that the 'module enabled/disabled parameter' may not have been properly exported; we'll figure out a remediation to that problem...* ^^

Promo Sheet

- A promotional sheet was created to quickly show the benefits of this project
- Sheet will be updated and made available for download



Waiver Request

- VA is actively pursuing VistA Standardization, therefore some sites using the program already are submitting Waiver Requests to document the variance in Class 1 routine ^ORWDPS2
- Most recently, Clarksburg VAMC (VA IT Region 4) submitted Waiver # 285673 on December 26, 2013
- Several other sites are using the program; this is the first formal waiver entry

New Service Request

- NSR #20100311 is also on file to request Class 3 to Class 1 conversion of the code
- The counterpart Pharmacy NSR is #20090403, for the Chicago version of the VistA Outpatient Pharmacy modifications. There is also a New Jersey version of the same business process.
- Chicago version – 5 routines, uses same setup process, limited to 1 lab test per drug
- New Jersey version – uses a new file structure to provide functionality for multiple lab tests per drug

Moving to the GENERAL concept...

- As shown on a previous slide, all of the code is in its own namespace, except for the one line “hook” into CPRS, via existing routine ^ORWDPS2
- The original program was written in AJEY* namespace
 - AJE is one of the Hines VA Hospital’s three local namespaces
 - AJEY identifies ‘RobWare’, to identify the developer
- Only the one line of code needs to be updated for conflicting OR* patches

Namespaces that I've used

- Code written at Hines VA Hospital – AJEY*
- Code written as part of work with VHA Pharmacy Benefits Management – PSUZ*
 - PSU* is the PBM Extract Vista package
 - PSUZ* identifies “local PBM Extract” code, but is likely traceable to the PBM office

Discussion of Alternative Hook Styles

- This program:

I \$L(\$T(SL^AJEY0110)) D SL^AJEY0110

- Another example:

S X="R2UXPD1" X ^%ZOSF("TEST") Q:'\$T

- For consideration –
 - any other approaches?
 - Is one of these preferred over the other?
 - Does one evaluate better via ^XINDEX, for example? Any SAC guidance?

Waiver Process

- Submissions through the VA Innovation and Development Request Portal (IDRP) website
- Review by the Waiver Request Committee
- CPRS Clinical Workgroup evaluates many of the requests
- The result is a “waiver to continue use of the non-standardized code”; NSR remains VA’s process for evaluation of national standardization of the code

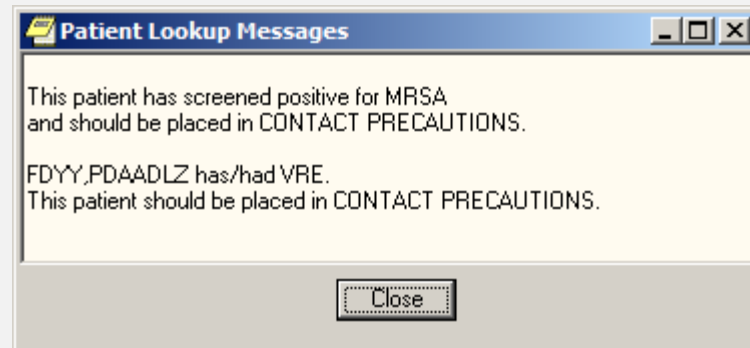
Minor Enhancement Team

- Chris Rhodes reported the formation of a 'minor enhancement team' to evaluate code changes
 - The intent of the hook concept is to keep changes “simple”
- News: Formation of a VistA Intake Workgroup to evaluate VA's import of existing functional code from external sources, e.g., local VA modifications, OSEHRA certified code, etc.

Another example of a “Hook”

- Routine A7RDPAGU (present at all VA instances), called by LEGACY^ORWPT
- Similar alternative process is also now sponsored by VA OIT Region 1

FLAG I +\$L(\$T(EN^AJEY7GUI)) G EN^AJEY7GUI



Examples of code that is more intrusive than a “hook”

Encounter Location
< Select a location from the tabs below.... >

Clinic Appointments | Hospital Admissions | **New Visit**

Visit Location

INFORMATION SYSTEMS CENTER
FAGAN TEST CLINIC-X
10CIU
10CIU DISCHARGE-X
10E DISCHARGE-PM-X
10E DISCHARGE-X
10EI

Date/Time of Visit
NOW ...

☐ Historical Visit: a visit that occurred at some time in the past or at some other location (possibly non-VA) but is not used for workload credit.

Available Reports

☒ Health Summary

- 0-Hines Health Summaries *****
- Adhoc Report
- Ambulatory Care Back Up Hs
- Back Up Health Summary
- Barthel Index Totals
- Braden Scale
- Community Provider Listing:
- Hines Ssa/Dds Standards
- Heparin IV Dosing
- Immunizations/Skin Tests
- Inpatient
- Iv Arterial Line Insertion
- Iv Central Line Insertion
- Iv Peripheral Line Insertion
- Implantable Medical Device(s)
- Interdisciplinary Plan
- Micu Transfer Health Summary
- Outpatient
- Outpatient Summary List
- Patient Education
- Problem List
- Problem List Profile
- Paramedics
- Preferred Healthcare Language
- Test Result Letters Last Year
- Test Result Letters Past (all)
- Varo Rating
- ***** Cboc *****
- Cboc Patient Profile
- Joliet
- Oak Lawn
- ***** Clinics *****
- A/C General Medicine
- A/C Inf Disease
- A/C Mhc
- A/C Renal
- A/C Substance Abuse
- Anticoag

Technical Details for Previous Examples

- Default Encounter Location
 - Hooks necessary in both ORWU and ORWU1, and not identically either

^ORWU

HOSPLOC+3 I \$D(^AJEY(578173,DUZ)) D NEWLOC^AJEYORWU(.Y,FROM,DIR) **Q**

^ORWU1

NEWLOC+4 I \$D(^AJEY(578173,DUZ)) D NEWLOC^AJEYORWU(.Y,ORFROM,DIR) **Q**

- New file required, no GUI available for end-user setup
- Note: this is not a HOOK – it's a replacement (see the QUIT)

Technical Details for Previous Examples

- Health Summary Categorization
 - Changes are in routine ORWRP (used to be more commonly patched)
 - The hook **replaces** the Class 1 code

Currently written as D CAT^AJEYHS G GETHS2

GETHS2 is a new linetag to skip over the “replaced” code

Linetag RPT previously needed changes too

Conclusion and Our Challenge

- In order to release these types of programs, we need to find and consider all the places where hooks could exist
- The release of each hook-style program might be like 'faucet drips', resulting in no better situation regarding multiple projects attempting to add a hook to the same Class 1 program
 - One or the other would have to wait!
- Can we ensure that multiple hooks in the same Class 1 are compatible?