



# VIReC Clinical Informatics CyberSeminar

## June 17, 2014

### *Modernizing VA Legacy Healthcare IT:*

# **RAPTOR Project**

## **(Radiology Protocol Tool Recorder)**

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# Disclosure & Acknowledgements



## ❧ Disclosure

- No financial interests

## ❧ Gratitude:

- VA Center for Innovation
- SAN Business Consultants, Rockville, MD



# R A P T O R



## ❧ Radiology Protocol Tool Recorder (RAPTOR)

- Developed through VA Center for Innovations
- Decision Support & Workflow tool
  - ✓ Safety
  - ✓ Quality
  - ✓ Efficiency
  - ✓ Compliance



# Objectives



## Radiology Protocol Tool Recorder (RAPTOR)

❧ Why RAPTOR?

❧ What is RAPTOR?

❧ Expected results?

❧ Implications for VA legacy healthcare IT  
Modernization



# Dx Imaging – Workflow Needs



## Advanced Medical Imaging

- CT | MR | Nuclear Med

## Compliance requirement

- Protocol assignment mandate (Joint Commission)
- Workflow documentation (best practices)

## Reality requirements

- Efficient (*“invisible” work value, therefore undervalued*)
- Accuracy important (*optimize information*)
- Responsibility (*accountability & documentation*)



# VA Form 519a



FROM: (TIME) MAR 15 2011 10:01:57.10:01/NO. 700004196 P. 2

>>Rad/WM Consultation for D/CT<<Printed: MAR 15, 2011 05:26 Page 1

-----

Name : [REDACTED] Urgency : ROUTINE  
 Pt ID Num : [REDACTED] Transport : AMBULATORY  
 Date of Birth: [REDACTED] Patient Loc: D/HEM/ONC  
 Age at req : [REDACTED] Phone Ext : 699-5907  
 Sex : [REDACTED]

-----

Requested: EECT CHEST W/CONT (CT Detailed 71260)  
 \*\* The requested procedure has contrast media assigned \*\*

Procedure Message:  
 -Current Results (within past 14 Days) for BUN & CREATININE Required.  
 -IF BUNR IS BELOW 60, PLEASE ORDER MUOOWYST

Request Status: PENDING (p)

Requester: [REDACTED]  
 Tel/Page/Dig Page: [REDACTED]  
 Attend Phy Current: UNKNOWN  
 Prim Phy Current: [REDACTED]  
 Tel/Page/Dig Page: [REDACTED]  
 Prim Phy At Order: UNKNOWN  
 Date/Time Ordered: Jan 07, 2011 11:42 am by [REDACTED]  
 Date Desired: Feb 07, 2011

[Barcode]

Reason for Study: lung cancer  
 Clinical History:  
 surveillance follow up

-----

Date Performed: \_\_\_\_\_ Case No.: \_\_\_\_\_  
 Technologist Initials: \_\_\_\_\_ Number/Size Films: \_\_\_\_\_  
 Interpreting Phys. Initials: \_\_\_\_\_

Comments:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

12-7  
 1.2  
 59L

---

9-6  
 1.2  
 59L

3 → admin



# Poll Question



How long does it take to progress from advanced medical imaging order placement to completed protocol using existing paper system?

- A) 4 Minutes
- B) 4 Hours
- C) 4 Days
- D) 4 Weeks



# R A P T O R - Objective



- ❧ Convert paper-based work flow for advanced medical imaging (CT, MR, Nuclear Med) to an optimized web-based tool
  
- ❧ Leverage *existing* VHA Information Systems
  
- ❧ Simultaneous improvements:
  - Productivity
  - Quality
  - Safety

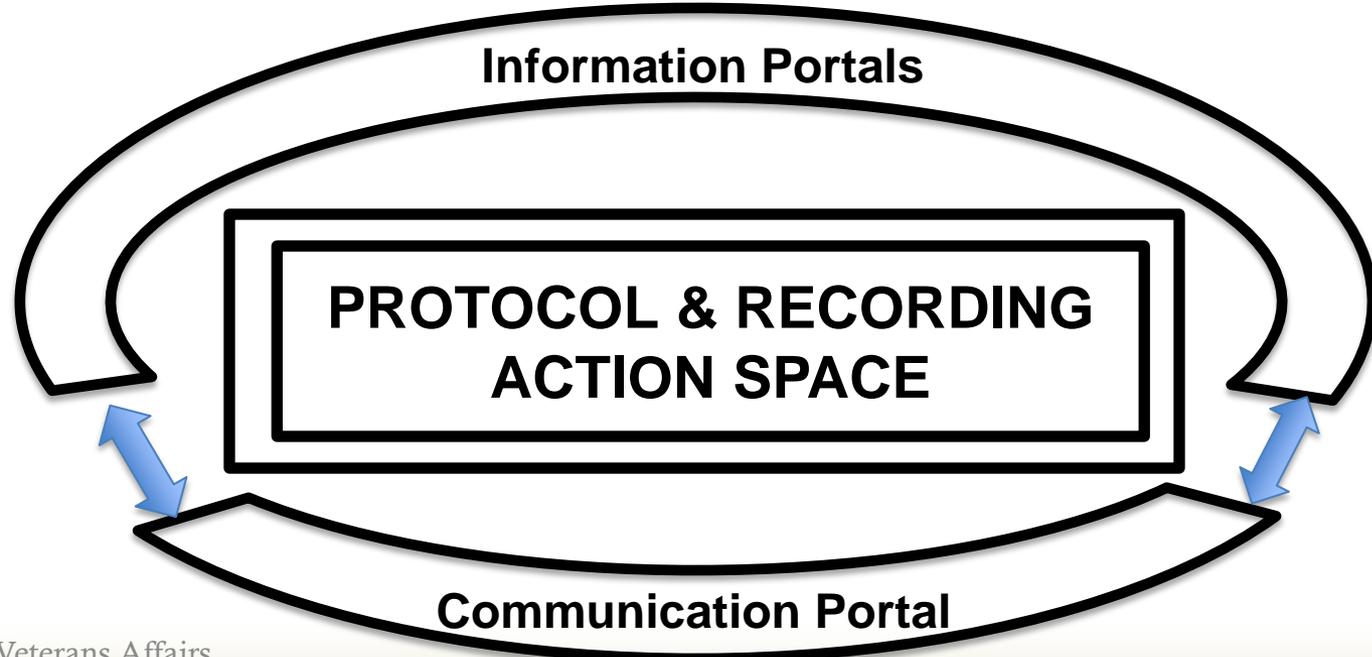


# RAPTOR



## ∞ Tailored electronic environment

- Display and coordinate functionality of information and resources needed to make rapid, informed protocol decisions & actions; facilitate communication
- Capture these medical events reliably and retrievably







# RAPTOR – Worklist



Worklist | RAPTOR | 184.73.210.16:8080/drupal/worklist

Apps | My groups - Go... | the FTP director... | SAN Business C... | Welcome on Ga... | VHA Innovation... | Fuze Meeting | Imported From IE | Google News | Imported From ...

Logged in as Dr. John Wright | Administer | Logout

**RAPTOR** Search

Ranking Mode: Standard  Change Columns Click Mode: Edit The Protocol Worklist Filter Mode: Needs Protocol

Tracking ID	Patient	Date/Time Desired	Date Ordered	Modality	Anatomy Imaging Subspecialty	Study	Urgency	Transport	Patient Category / Location	Workflow Status	Assignment	Scheduled
2916	ONEZEROONEONEZEROEIGHT, PATIENT	APR 24, 2012	DEC 02, 2013@18:55	MR	MAGNETIC RESONANCE IMAGING	MAGNETIC IMAGE,THORACIC SPINE	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	2014-L-17@138977
2902	ONEZEROONEONEFOURSIK, PATIENT	DEC 05, 2012	DEC 02, 2013@18:45:23	CT	GENERAL RADIOLOGY	CT SAGGITAL CORONAL OBLIQUE RECONSTRUCTION	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	2014-L-7@138977
2908	ONEZEROONEONEZEROSEVEN, PATIENT	APR 17, 2012	DEC 02, 2013@18:53:28	MR	MAGNETIC RESONANCE IMAGING	MAGNETIC IMAGE,THORACIC SPINE	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	2014-L-12@138977
2897	ONEZEROONEONEFOURFOUR, PATIENT	JAN 24, 2012	DEC 02, 2013@18:45:23	CT	GENERAL RADIOLOGY	CT NECK SOFT TISSUE W/CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	2014-L-2@138977
2896	ONEZEROONEONEFOURFOUR, PATIENT	DEC 03, 2012	DEC 02, 2013@18:45:23	CT	GENERAL RADIOLOGY	CT PELVIS W/CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	T@23
2898	ONEZEROONEONEFOURFOUR, PATIENT	FEB 06, 2012	DEC 02, 2013@18:45:23	CT	GENERAL RADIOLOGY	CT UPPER EXTREMITY W/CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	T@23
2899	ONEZEROONEONEFOURFIVE, PATIENT	DEC 04, 2012	DEC 02, 2013@18:45:23	CT	GENERAL RADIOLOGY	CT PELVIS W/O CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	T@23
2900	ONEZEROONEONEFOURFIVE, PATIENT	JAN 25, 2012	DEC 02, 2013@18:45:23	CT	GENERAL RADIOLOGY	CT NECK SOFT TISSUE W/O CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	T@23
2901	ONEZEROONEONEFOURFIVE, PATIENT	FEB 09, 2012	DEC 02, 2013@18:45:23	CT	GENERAL RADIOLOGY	CT UPPER EXTREMITY W/O CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	T@23

Desktop 10:04 AM 5/28/2014



# RAPTOR – Worklist



## RAPTOR

Rank

Change Columns

Click Mode: Edit The Protocol

Worklist Filter Mode: Needs Protocol

Navigation buttons: < << >> >

Study	Urgency	Transport	Patient Category / Location	Workflow Status	Assignment	Scheduled
<input type="checkbox"/> 29 MAGNETIC IMAGE,THORACIC SPINE	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">2014-4-17@1000??</a>
<input type="checkbox"/> 29 CT SAGGITAL CORONAL OBLIQUE RECONSTRUCTION	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">2014-4-7@1600??</a>
<input type="checkbox"/> 29 MAGNETIC IMAGE,THORACIC SPINE	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">2014-5-12@1300??</a>



# RAPTOR – Worklist SORTING



**RAPTOR** Search

Ranking Mode: Standard  Change Columns Click Mode: Edit The Protocol Worklist Filter Mode: Needs Protocol

Tracking ID	Patient	Date/Time Desired	Date Ordered	Modality	Anatomy Imaging Subspecialty	Study	Urgency	Transport	Patient Category / Location	Workflow Status	Assignment	Scheduled
<input checked="" type="checkbox"/> 2010	ONE, PATIENT	SEP 12, 2012	SEP 12, 2012@11:27:41	CT	CT SCAN	CT ABDOMEN W/O CONT	STAT	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">TR022</a>
<input type="checkbox"/> 2011	ONE, PATIENT	SEP 12, 2012	SEP 12, 2012@11:33:43	CT	CT SCAN	CT ABDOMEN W/O CONT	STAT	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">2014-8-28110922</a>
<input type="checkbox"/> 407	ZZZRETFOURFORTY, PATIENT	APR 01, 1993	APR 01, 1993@09:16:37	CT	GENERAL RADIOLOGY	CT ABDOMEN W/O CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">TR022</a>
<input type="checkbox"/> 408	ZZZRETFOURFORTY, PATIENT	APR 01, 1993	APR 01, 1993@09:18:52	CT	GENERAL RADIOLOGY	CT CERVICAL SPINE W/O CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">2014-8-28110922</a>
<input type="checkbox"/> 443	ZZZRETFVESEVENTYFOUR, PATIENT	APR 23, 1993	APR 23, 1993@12:37:48	CT	GENERAL RADIOLOGY	CT THORAX W/O CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">TR022</a>
<input type="checkbox"/> 448	ZZZRETREDZERO, PATIENT	APR 23, 1993	APR 23, 1993@14:02:59	CT	GENERAL RADIOLOGY	CT THORAX W/O CONT	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">TR022</a>
<input type="checkbox"/> 801	ZZZRETFOURTHIRTYTWO, PATIENT	DEC 21, 1993	DEC 21, 1993@11:27:11	NM	NUCLEAR MEDICINE	BONE MARROW IMAGING, WHOLE BODY (W/ W/O SPOT VIEWS) ONLY	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">TR022</a>
<input type="checkbox"/> 742	ZZZRETFOURNINETYFIVE, PATIENT	JUN 22, 1994	JUN 22, 1994@11:30:18	NM	NUCLEAR MEDICINE	BONE DENSITY STUDY, DUAL PHOTON ABSORPTIOMETRY	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">TR022</a>
<input type="checkbox"/> 811	ZZZRETFIVESEVENTYFOUR, PATIENT	JUN 22, 1994	JUN 22, 1994@11:30:18	NM	NUCLEAR MEDICINE	BONE DENSITY STUDY, DUAL PHOTON ABSORPTIOMETRY	ROUTINE	AMBULATORY	OUTPATIENT	Not Implemented	Not Implemented	<a href="#">2014-6</a>





# RAPTOR - Workflow



## Protocol

- Active order is assigned then selected.
- Hydration, contrast, informed consent & sedation based on case.
- Radiologist or Resident reviews and approves the protocol.

## Examination

- Technologist acknowledges protocol.
- Actual hydration, contrast & sedation and radiation are noted.
- Exam is completed.

## Interpretive

- Radiologist reviews actual vs. planned.
- Post-examination observations are noted.
- Quality Control is noted for completed exams.



# R A P T O R – Protocol Page



Protocol | RAPTOR

184.73.210.16:8080/drupal/protocol?rawrtid=%5B407%5D

My groups - Go... the FTP director... SAN Business C... Welcome on Ga... VHA Innovat... Fuze Meeting Imported From IE Google News Imported From ...

Tracking ID	Case ID	Procedure	Image Type	Requested By	Patient Location	Category
407	Not Implemented	CT ABDOMEN W/O CONT	GENERAL RADIOLOGY	ZZPROGRAMMER.TWENTYTWO	RADIOLOGY MAIN FLOOR	Not Implemented
Ordered/Due Date	Patient Category	Reason for Study	SSN	Transport	Urgency	
APR 01, 1993@09:18:37	OUTPATIENT	NOT ENTERED	666612546	AMBULATORY	ROUTINE	
Patient Name	Age	Clinical History	DOB	Ethnicity	Gender	
ZZZRETFOURFORTY.PATIENT	79	Not Implemented	04/07/1935		M	

Protocol Medications Vitals Allergies Labs Dose Hx Clin rpts Problem List Notes Rad rpts Library

- At risk for contrast. Acute Renal Impairment.
- Image guided exam contraindicated due to the use of Metformin.

### Order Overview

Requested By:	ZZPROGRAMMER.TWENTYTWO
PCP:	Unknown
Attending:	Unknown
Requested Study:	CT ABDOMEN W/O CONT
Reason For Study:	NOT ENTERED

### Medications

Med	At Risk ?	Status
-----	-----------	--------

(see medications detail)

### Vitals



Protocol Name  
  
 A standard protocol from the hospital's radiology notebook.

2nd Protocol Name  
  
 Select a second protocol only if more than one is needed for this study.

Hydration  
 None  
 Oral   
 IV   
 Acknowledge Selected Values  
 You are being asked to acknowledge these values because they are currently the default values.

Sedation  
 None  
 Oral   
 IV



# RAPTOR - Information Dashboard



## Medications

Med	At Risk ?	Status
-----	-----------	--------

[\(see medications detail\)](#)

## Vitals



Date	Vital
04/07/2003 10:26 am	Temperature
04/07/2003 10:26 am	Blood Pressure

[\(see vitals detail\)](#)

## Allergies

Allergy Reactant	Allergy Type	Verif Date
DRUG	RADIOLOGICAL/CONTRAST MEDIA	04/08/1994

[\(see allergies detail\)](#)

Protocol | RAPTOR

184.73.210.16:8080/drupal/protocol?rawrtid=%5B407%5D

DRUG	RADIOLOGICAL/CONTRAST MEDIA	04/08/1994
------	-----------------------------	------------

[\(see allergies detail\)](#)

## Labs

RENAL PANEL		
Date	Creatinine	eGFR

[\(see labs detail\)](#)

## Radiology Reports

Title	Date
NECK SOFT TISSUE	10/01/1993 10:22 am
FOOT 2 VIEWS	04/13/1989 08:41 am
ZZCHEST 2 VIEWS PA&LAT	04/13/1989 08:39 am

[\(see radiology detail\)](#)



# RAPTOR - Pre-populated Template



Protocol | RAPTOR

184.73.210.16:8080/drupal/protocol?rawtid=%5B407%5D

My groups - Go... the FTP director... SAN Business C... Welcome on Ga... VHA Innovation... Fuze Meeting Imported From IE Google News Imported From ...

PCP: Unknown  
Attending: Unknown  
Requested Study: CT ABDOMEN W/O CONTRAST  
Reason For Study: NOT ENTERED

**Medications**

Med	At Risk ?	Status
<a href="#">(see medications detail)</a>		

**Vitals**

Date	Vital	Value
04/07/2003 10:26 am	Temperature	98.6 F
04/07/2003 10:26 am	Blood Pressure	150/60 mmHg

[\(see vitals detail\)](#)

**Allergies**

Allergy Reactant	Allergy Type	Verification Date	O/H
DRUG	RADIOLOGICAL/CONTRAST MEDIA	04/06/1994	Not Implemented

[\(see allergies detail\)](#)

**Labs**

RENAL PANEL		
Date	Creatinine	eGFR
<a href="#">(see labs detail)</a>		

**2nd Protocol Name**

Select a second protocol only if more than one is needed for this study.

**Hydration**

None  Oral  IV

500cc H2O over 2hr pre-scan + post-scan

Acknowledge Selected Values  
You are being asked to acknowledge these values because they are currently the default values.

**Sedation**

None  Oral  IV

**Contrast**

None  Enteric  IV

**Allergy**

Unknown  No  Yes

**Claustrophobic**

Unknown  No  Yes



# RAPTOR – Custom Text Pre-population Options



The screenshot displays the RAPTOR web application interface. At the top, a browser window shows the URL `184.73.210.16:8080/drupal/protocol/rawrbid=%5B407%5D`. The main content area is divided into several sections:

- DRUG**: RADIOLOGICAL/CONTRAST MEDIA, 04/08/1994, Not Implemented. Includes a link for [\(see allergies detail\)](#).
- Labs**: A table titled **RENAL PANEL** with columns for Date, Creatinine, and eGFR. Includes a link for [\(see labs detail\)](#).
- Radiology Reports**: A table with columns for Title and Date. Reports include: NECK SOFT TISSUE (10/01/1993 10:22 am), FOOT 2 VIEWS (04/13/1989 08:41 am), and ZZCHEST 2 VIEWS PA&LAT (04/13/1989 08:39 am). Includes a link for [\(see radiology detail\)](#).
- PROTOCOL NOTES BOILERPLATE TEXT HELPERS**: A section with buttons for **General** (Labs Needed, Unauthorized Provider, On Table Check, Mass Markers), **Premedication** (Methylprednisolone, Prednisone, Diphenhydramine, Emergency), and **Hydration** (Oral, IV Outpatient, IV Inpatient).
- Protocol Notes**: A text area containing the following text:  
Scheduler, please assure patient gets renal function laboratory blood draw prior to exam.  
Unauthorized ordering provider for this joint MRI examination. Please contact provider and recommend referral to Orthopedics, Rehabilitation Medicine, or Rheumatology.  
Methylprednisolone 32 mg PO q 12 hr and 2 hr before scan
- CONTRAINDICATIONS REQUIRING CONFIRMATION**: A list of checkboxes and bullet points:
  - Acknowledgement of potential allergy required
    - Potential history of imaging contrast dye allergy
    - Consent is required when a potential allergy is detected
  - Acknowledgement of contraindication dos festada vida okal e plurum required

Two blue arrows point from the right side of the interface towards the 'Labs Needed' and 'Methylprednisolone' buttons in the 'PROTOCOL NOTES BOILERPLATE TEXT HELPERS' section.



# Contraindication details



The screenshot shows a web browser window displaying the RAPTOR interface. At the top, there's a navigation bar with 'Protocol | RAPTOR' and a URL. Below that is a 'Radiology Reports' section with a table:

Title	Date
NECK SOFT TISSUE	10/01/1993 10:22 am
FOOT 2 VIEWS	04/13/1989 08:41 am
ZZCHEST 2 VIEWS PA&LAT	04/13/1989 08:39 am

Below the table are sections for 'PROTOCOL NOTES BOILERPLATE TEXT HELPERS', 'General' (with buttons for 'Labs needed', 'Unauthorized Provider', 'On Table Check', 'Mass Markers'), 'Premedication' (with buttons for 'Methylprednisolone', 'Prednisone', 'Diphenhydramine', 'Emergency'), and 'Hydration' (with buttons for 'Oral', 'IV Outpatient', 'IV Inpatient').

The 'Protocol Notes' section contains text: 'Scheduler, please assure getless gets renal function laboratory blood draw prior to exam. Unauthorized ordering provider for this joint MRI examination. Please contact provider and recommend referral to Orthopedics, Rehabilitation Medicine, or Rheumatology. Methylprednisolone 32 mg PO q 12 hr and 2 hr before scan'.

The 'CONTRAINDICATIONS REQUIRING CONFIRMATION' section has two main items:

- Acknowledgement of potential allergy required
  - [Potential history of imaging contrast dye allergy](#)
  - [Consent is required when a potential allergy is detected](#)
- Acknowledgement of contraindication dos testada vida dikai e plurum required
  - [At risk for e plurum unum vita](#)
  - [At risk for e plurum unum vita](#)

A tooltip window is overlaid on the screen, containing the text: 'The page at 184.73.210.16:8080 says: RAPTOR will compare the patient's Allergy list against a set of user configurable key words to identify patients with a past history of adverse reaction to imaging contrast agents. If RAPTOR identifies a match, then RAPTOR will flag with user configurable message that consent is required.' A blue arrow points from the tooltip to the 'Potential history of imaging contrast dye allergy' link. Another blue arrow points from the 'CONTRAINDICATIONS REQUIRING CONFIRMATION' section to the 'Potential history of imaging contrast dye allergy' link.

At the bottom of the interface, there are buttons for 'Assign', 'Request Specialist', 'Suspend', 'Release back to Worklist', 'Reserve', and 'Send Email'. The Windows taskbar at the bottom shows the time as 10:12 AM on 5/28/2014.



# Protocol suspended



The screenshot displays the RAPTOR web application interface. At the top, a navigation bar includes the RAPTOR logo, a search bar, and the user's login information: "Logged in as Dr. John Wright | Administrator | Logout". Below the navigation bar is a table of protocol data. A yellow banner highlights two risk factors: "1. At risk for contrast: Acute Renal Impairment" and "2. Image guided exam contraindicated due to the use of Nitroglycerin". A "Suspend Ticket" dialog box is open, with a blue arrow pointing to the "Notes" field. The notes contain the text: "This was not implemented since the patient did not show." The dialog box also includes a "Reason for suspend" dropdown menu, a "Remove ticket from worklist" button, and "Cancel" and "OK" buttons. The main interface also shows sections for "Order Overview", "Medications", and "Vitals", with a line graph for temperature.

Tracking ID	Case ID	Procedure	Image Type	Requested By	Patient Location	Category
407	Not Implemented	CT ABDOMEN W/O CONT	GENERAL RADIOLOGY	ZZPROGRAMMER, TWENTYTWO	RADIOLOGY MAIN FLOOR	Not Implemented

Ordered/Due Date	Patient Category	Reason for Study	SSN	Transport	Urgency
APR 01, 1003@09:18:37	OUTPATIENT	NOT ENTERED	666612546	AMBULATORY	ROUTINE

Patient Name	Age	Clinical History	DOB	Ethnicity	Gender
ZZZRETFOURFORTY, PATIENT	79	Not Implemented	04-07/1930		M

**Suspend Ticket**

Reason for suspend:

Patient requested: [dropdown]

Notes:

This was not implemented since the patient did not show.

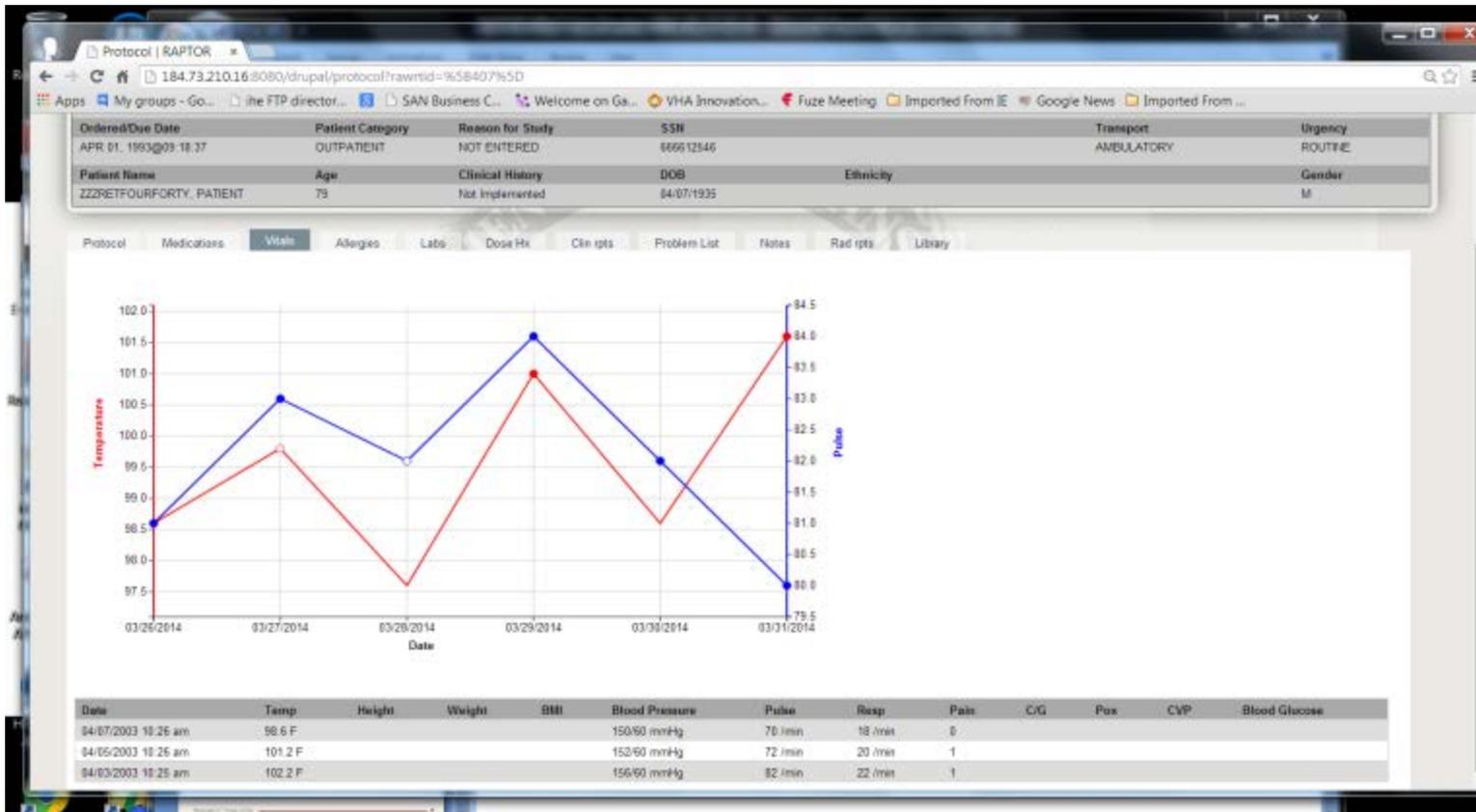
Remove ticket from worklist

Cancel

OK

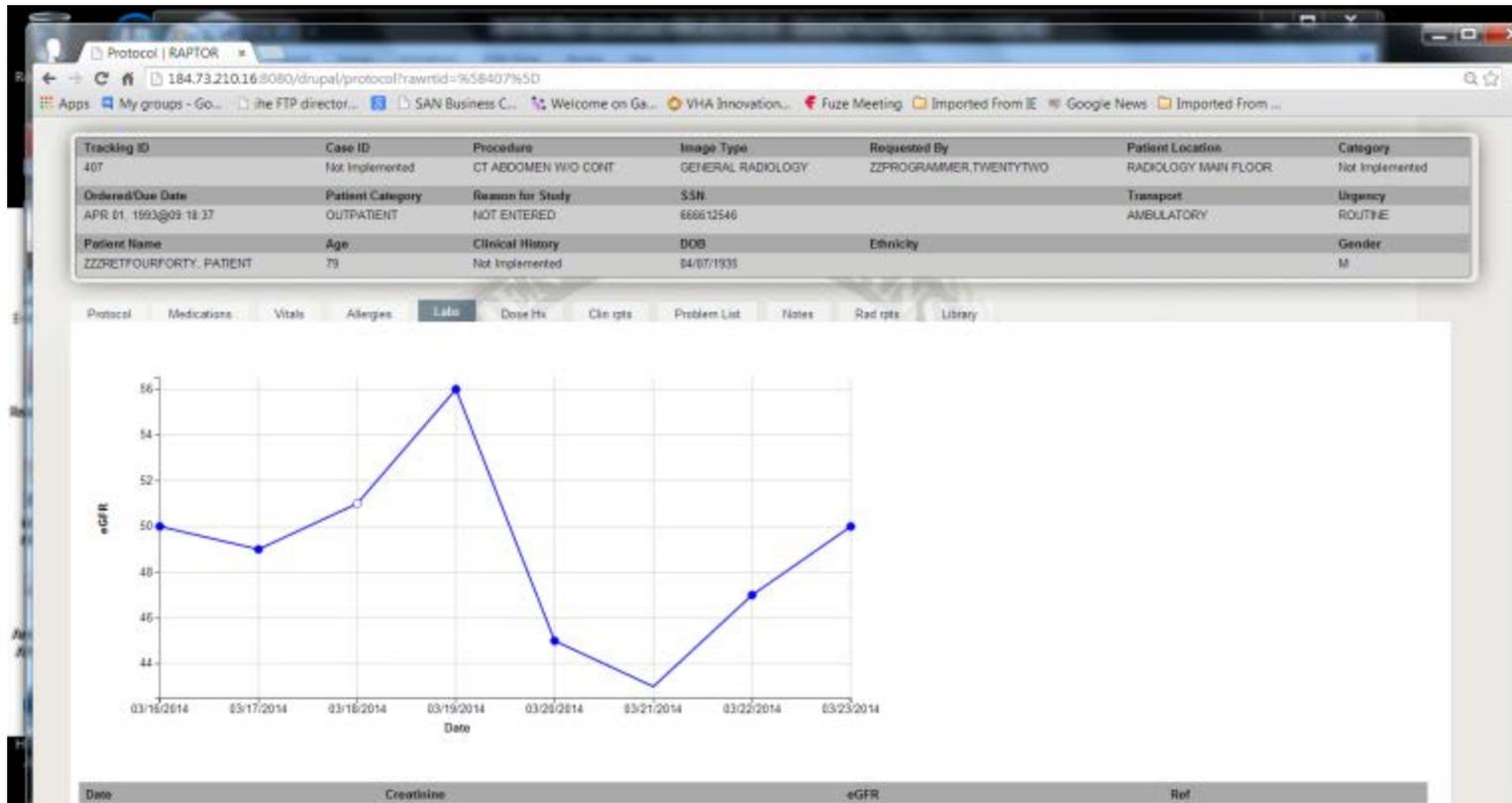


# Vitals tab





# Labs tab





# RAPTOR – Features



- ❧ Tracks entire Protocol Workflow
  - Who did what, when
- ❧ Detect “at-risk” drug interactions
- ❧ Detect need for informed consent
- ❧ Contraindications are acknowledged
- ❧ Monitor radiation dose history
- ❧ Protocol Library maintained
- ❧ RAPTOR can be used throughout the workflow
  - Protocol, Examination and Interpretation phases



# R A P T O R – Before & After



Attribute	Before RAPTOR	With RAPTOR
Environment	Paper	Web-based, paperless
Level of Interoperability	Lowest – paper or scanned paper	Highest – Computational electronic data
Patient Identifiable Information	Poor (if any) security control	Role based authentication
Collaboration, communication	Handwritten, Fax or phone	Automated into workflow
Work distribution	Stacks of paper manually distributed	Entire worklist process is automated with business priorities set by configurable rules
Records Management	Shred or scanned	Entire process is recorded for management review and reporting



# RAPTOR – Expected Benefits



- ❧ Improve clinical decisions & patient care
- ❧ Replace inefficient paper-based processes
  - No lost paperwork
  - No duplication of paperwork (and effort)
  - No vague documentation of responsibility
- ❧ Improve radiologist & department productivity/efficiency
- ❧ Benefit medical appropriateness
- ❧ Benefit patient safety
- ❧ Audit patient consent
  
- ❧ ...the future of VA legacy healthcare IT modernization?



# VA Legacy Healthcare IT



- ❧ New development takes too long to deliver
  - Multi-year release cycle is normal
- ❧ New technology/ideas integration takes too long
- ❧ Dated technology, needlessly complex
- ❧ Maintenance, installation and operations difficult
- ❧ Unanimous panel recommendation for migration to an openly architected, modular, and standards-based platform
- ❧ *Reference: American Council for Technology – Industry Advisory Council VistA Modernization report (May 2010)*



# VistA Evolution Program Plan

(March 2014)



- ❧ Focus on delivering an evolved VistA that is open architected and non-proprietary in design
- ❧ Based firmly upon the work that has come before
  - Harness powerful core of software and business processes embedded within VistA
  - Apply modern computing architecture
    - ✓ Modular, Extensible
  - Fully leverage VA's investment in VistA
- ❧ Achieve an interoperable EHR (e.g. DoD, VA)



# VistA Evolution Program Plan

(March 2014)



## ❧ *4.1.5 Ancillary Services*

- ❧ Improvements to ancillary systems such as laboratory, pharmacy, and **radiology solutions** will provide enhanced support of laboratory, pharmacy, and imaging functions that allow pathologists, pharmacists, radiologists, and associated technicians **to more efficiently follow best practices**. These enhanced ancillary services will also **enable more robust CDS** for clinicians, allowing them **to provide improved quality, safety, efficiency, and satisfaction** in healthcare for Veterans, Service members, and their dependents.



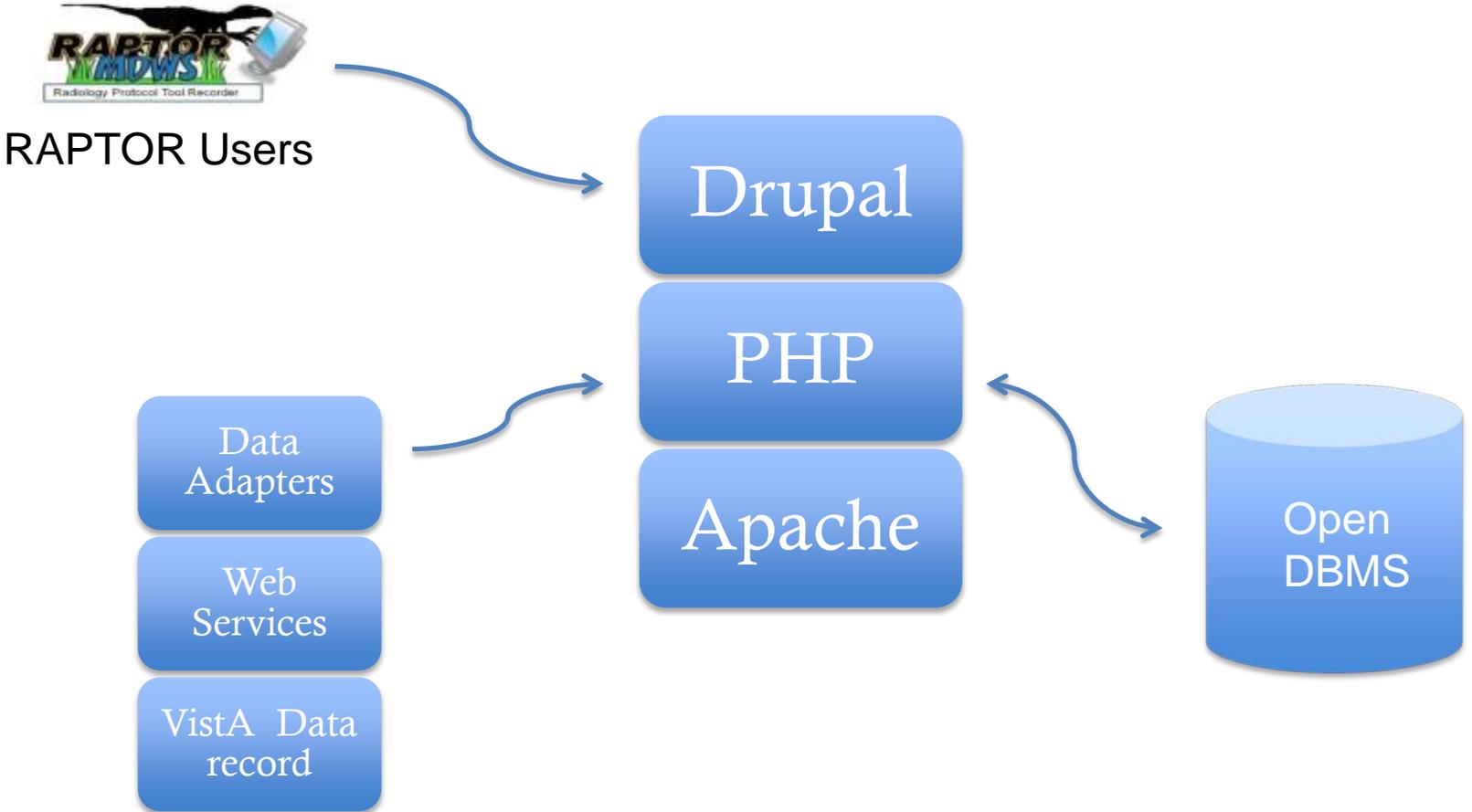
# Modernization – RAPTOR Approach



- ❧ Open architecture; modular, standards-based platform
  - e.g. Linux, Apache, MySQL, PHP (“LAMP stack”)
- ❧ Open source tools
  - e.g. Drupal CMS
- ❧ Reuse existing components/services
  - e.g. Web Services
    - ✓ VA Medical Domain Web Services (MDWS)



# RAPTOR Open Architecture





# Open Source – Benefits



## ❧ Innovation Opportunities

- using building blocks
- using abstraction layers

## ❧ Modification & Extension Opportunities

- build on existing resources
- replacement of volatile things simplified

## ❧ Value Opportunities

- lower cost (e.g. zero or minimized licensing fees)
- more options
- reduced proprietary lock-in risks
- easier integrations



# Modernization – RAPTOR evolution >>> VIPER



- ❧ RAPTOR demonstration – an opportunity for VA and other US government agencies
- ❧ VA Integrated Platform for Enterprise Radiology (**VIPER**); currently a concept
  - Achievable
    - ✓ Read-Write interactivity with VistA
    - ✓ Integration of additional modules (e.g. scheduling, radiology information system (RIS) functions, imaging modality interfaces, etc.)
    - ✓ Targeted interactivity to de-silo the info and resources
    - ✓ Build from what works and is familiar
  - Hugely facilitated by open source



# Thank You

VIReC Clinical Informatics CyberSeminar  
June 17, 2014

*Modernizing VHA Legacy IT:*  
**RAPTOR Project**  
(Radiology Protocol Tool Recorder)

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