



VHA Innovation Initiative

Radiology Protocol Tool Recorder (RAPTOR)

Jonathan Medverd, MD
Staff Radiologist, PSHCS
Seattle, WA

Andrew Casertano, MS & Frank Font, MS
SAN Business Consultants
Rockville, MD





Objectives



- ❧ Convert paper based Radiology Protocol process to a web based tool
- ❧ Make rapid, informed protocol decisions and actions
- ❧ Maximize Radiologist advanced imaging protocoling effectiveness while improving productivity



Benefits



- ❧ Improve clinical decisions and patient care
- ❧ Replace inefficient paper – based processes
 - No lost paperwork
 - No duplication of paperwork (and effort)
 - No vague documentation of responsibility
- ❧ Improve radiologist & department efficiency
- ❧ Benefit medical appropriateness
- ❧ Benefit patient safety
- ❧ Audit patient consent



RAPTOR - the Electronic 519 Form ... and more



Current Paper 519 Form

RAPTOR

Current CPRS order protocol workflow supported in
RAPTOR web form

Form 519a-ADP

12-7
1.2
59
9.6
1.2
3 → a e m n b

Requested: 22CT CHEST W/CONT (CT Detailed 71240)
** The requested procedure has contrast media assigned **
Procedure Message:
- Current Results (within past 14 Days) for RUN & CREATININE Required.
- IF BGRF IN BELOW 60, PLEASE ORDER NUCOMYST
Request Status: PENDING (p)
Requester: SHIONOTO, GAIL M (CT Detailed 71240)
Tel/Page/Dig Page: 515.659.4707 / /
Attend Phy Current: UNKNOWN
Prim Phy Current: VERNON, LANCE R MD
Tel/Page/Dig Page: 2221 / /
Prim Phy At Order: UNKNOWN
Date/Time Ordered: Jan 07, 2011 11:42 am by SHIONOTO, GAIL M
Date Desired: Feb 07, 2011
Reason for Study: lung cancer
Clinical History: surveillance follow up
Date Performed: _____ Case No.: _____
Technologist Initials: _____ Number/Size Film: _____
Interpreting Phys. Initials: _____
Comments: _____
VA Form 519a-ADP

Radiologist and Tech's comments are
captured

Not an enabled user of RAPTOR
Logged in as NON-AUTH-USER

Form 519a-ADP

Requester: SHIONOTO, GAIL M
Tel/Page/Dig Page: 515.659.4707 / /
Attend Phy Current: UNKNOWN
Prim Phy Current: VERNON, LANCE R MD
Tel/Page/Dig Page: 2221 / /
Prim Phy At Order: UNKNOWN
Date/Time Ordered: Jan 07, 2011 11:42 am by SHIONOTO, GAIL M
Date Desired: Feb 07, 2011

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

Order Overview

Medications

Vitals

Contrast

ALLERGY

LABS

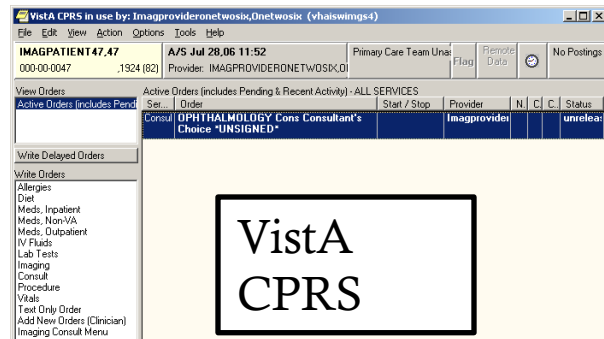
Radiology Reports

Pending Radiology Orders

Additional patient safety checks and
contraindications



Current Workflow from Order to Schedule



Clinician

Manual Processes
(performed by either
Front Desk,
Scheduler or
Technician)

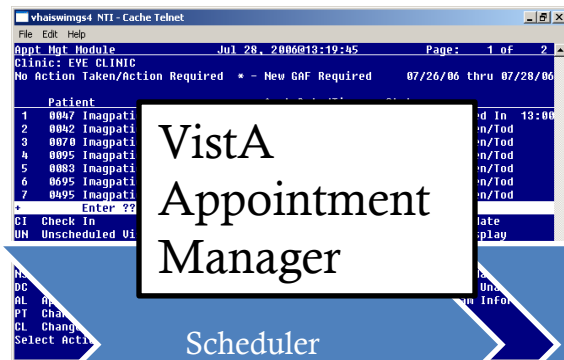
Radiologist

Manual Processes
(performed by either
Front Desk,
Scheduler or
Technician)

- Places Imaging Request in CPRS
- Print VistA CPRS Imaging Order
- Orders are manually sorted by Modality/specialty for workload distribution
- Additional significant clinical information may be collected and included with Protocol Packet
- Delivers Protocol Packet to Radiology Area by Modality/specialty
- Review Protocol Packet Information
- Additional clinical information may be collected and reviewed
- Prior Studies and Reports through PACS
- Lab information through VistA
- May call Clinician to discuss order
- Handwritten Protocol on coversheet with radiologist's signature or initial
- Picks up Protocol information from radiology area
- Protocol coversheet may be scanned
- Procedure is Scheduled in VistA Radiology
- Appointment Information is manually entered into VistA Appointment Manager



Current Protocol Workflow from Schedule to Report



- Patient is scheduled & contacted regarding appointment
- Procedure prep (Q&A)

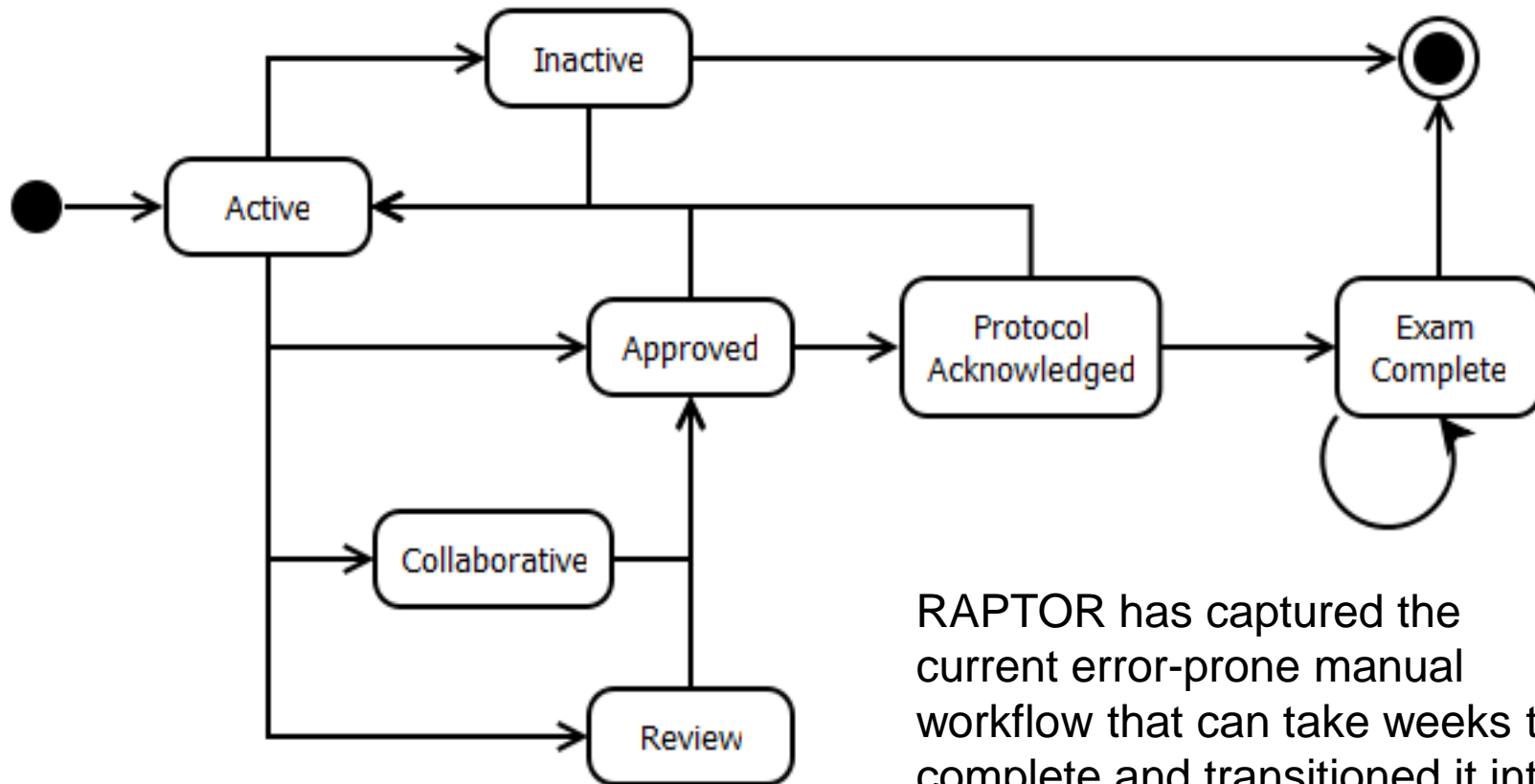
- Scheduled exams are Registered. This generates an exam accession # and corresponding printed bar code card
- Reviews Modality Worklist
- Brings Patient to Modality
- Performs Protocol as specified by radiologist
- May call Radiologist to discuss protocol instructions
- May scan protocol sheet and Q&A into patient record
- Exam Case Edited and Completed

- Reviews Reading Worklist
- Refers to clinical symptoms & original protocol
- May call technician to discuss image
- Reviews and reads Image at PACS Workstation
- Dictates Report
- May call Clinician to discuss Report
- Must call Clinician to discuss critical result.

- Reviews Report with Patient



RAPTOR State Diagram



RAPTOR has captured the current error-prone manual workflow that can take weeks to complete and transitioned it into an electronic process that can be completed in minutes.



RAPTOR Workflow (Diagnostic)



Vista CPRS in use by: Imagprovideronnetwosix,0netwosix (vhaiswings4)

File Edit View Action Options Tools Help

IMAGPATIENT 47.47 A/S Jul 28.06 11:52 Primary Care Team Unas Flag Remove Data No Postings

000-00-0047 .1324 (82) Provider: IMAGPROVIDERONNETWOSIX.DI

View Orders Active Orders (includes Pending & Recent Activity) - ALL SERVICES

Order	Start / Stop	Provider	N	C	C	Status
Consult: OPHTHALMOLOGY Cons Consultant's Choice "UNSIGNED"		Imagprovider				unreleased

Write Delayed Orders

Write Orders

Allergies

Diet

Med: Inpatient

Med: Non-VA

Med: Outpatient

IV Fluids

Lab Tests

C. Pro. Vitals Text Only Add New O. Imaging Consult.

Cover Sheet | Problem...

MDWS



RAPTOR

Id: 40 Name: ZZZRETFIVETWENTYNINE,PATIENT Age: 76

Loc: Room: / Bed: Transp: INPATIENT

Study: CHEST SINGLE VIEW Img Type: GENERAL RADIOLOGY Urgency: R

protocol medications vitals allergies labs rad exp clin rpts problem list notes rad rpts library

RAPTOR (typically support staff)

Radiology Protocol Tool and Reporter (RAPTOR)

RAPTOR(Radiologist)

- Web Services automatically pulls Imaging Request and Patient Information into Medical Domain Web Services
- RAPTOR creates prioritized and specialized sorted protocol worklist
- Expert Logic warns for contrast drug interaction or lapsed lab result
- Reviews and confirms clinical information through RAPTOR
- May utilize web viewer to review prior Studies and Reports
- May utilize secure messaging to discuss order
- Protocol confirmed with Digital Signature



RAPTOR Workflow (Examination & Interpretive)



RAPTOR is used in parallel with VistA Radiology Information System and Appointment Manager

PACS

Scheduler

Technologist

Radiologist

Clinician

- Order in RIS is assigned
- Patient is contacted and scheduled
- Procedure prep (Q&A)
- May utilize secure messaging to communicate

- Scheduled exams are Registered. This generates an exam accession # and corresponding bar code
- Reviews Modality Worklist
- Brings Patient to Modality
- Performs Protocol as specified by radiologist
- May contact Radiologist thorough secure messaging to discuss protocol instructions
- Exam Case Edited and completed

- Reviews Reading Worklist
- Refers to clinical symptoms & original protocol
- Reviews and reads Image at PACS Workstation
- Dictates Report
- May contact Clinician through secure messaging to discuss non-critical Report Diagnosis
- May contact technician through secure messaging to discuss image

- Reports are sent and can be viewed through VistA
- Reviews Report with Patient



Web Development Strategy

- ∞ Open Source, Open Standards, Application Development and Environment
 - Mature open source tools and solutions
 - High functionality in a short time
 - Zero licensing costs
 - Low administration burden
 - Strategy fits with Industry Advisory Council (IAC) VistA Modernization Report



RAPTOR Architecture



RAPTOR User Interface/ Content Management

Data Adapters

MDWS

CPRS Data

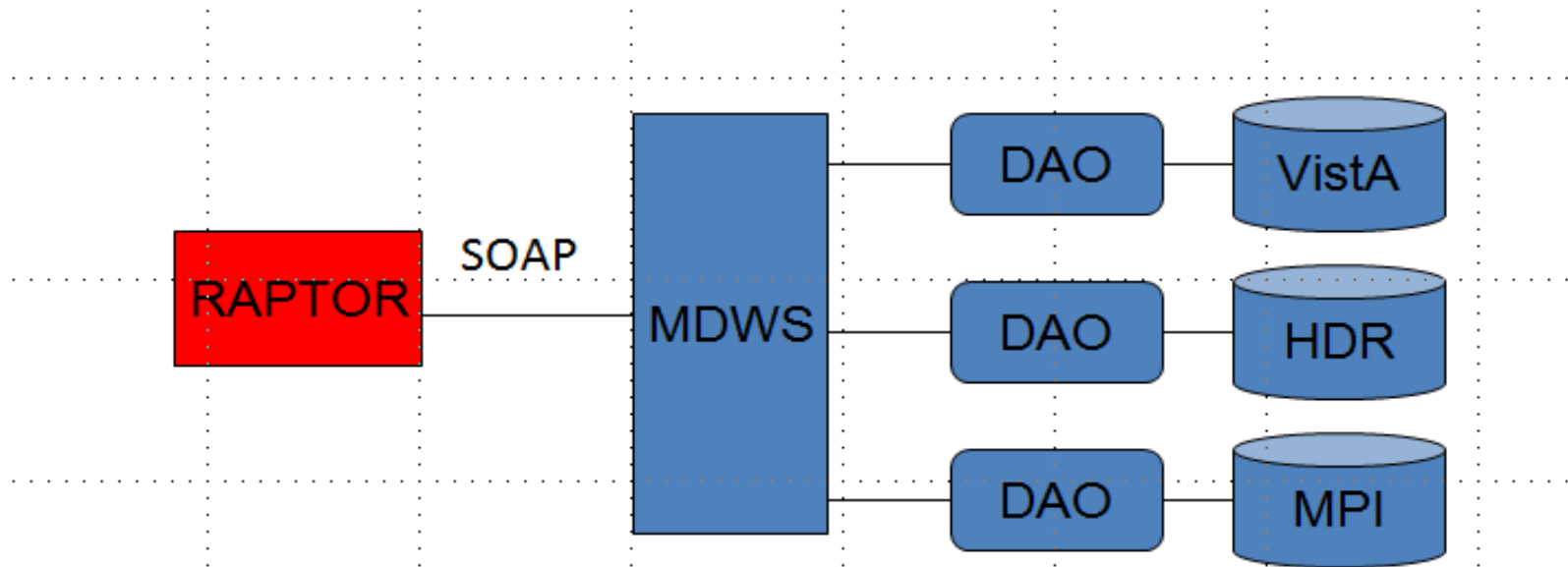
Other Clinical &
Imaging
Systems

Other Clinical &
Imaging Data

Future Capabilities



RAPTOR communicates with VistA through MDWS



- MDWS is a suite of SOA middle-tier web services.
- MDWS virtualizes VistA RPCs as a web service.
- RAPTOR uses Simple Object Access Protocol (SOAP), the standardized protocol to communicate with MDWS



RAPTOR – Features



- ❧ Tracks entire Protocol Workflow
 - Who did what, when
- ❧ Ability to detect “at-risk” drug interaction
- ❧ Contraindications are acknowledged
- ❧ Monitor radiation dose history
- ❧ RAPTOR can be used throughout the workflow: protocol, examination and interpretation phases
- ❧ Protocol Library maintained



Protocol Worklist



Logged in as Dr. John Alcmæon

Assignment Filter: Standard filtering ▼

Action	Patient	Date Desired	Date Ordered	Study	Urgency	Transport	Patient Category/ Location	Anatomy/ Imaging Subspecialty	Workflow Status	Assignment
edit view <input type="checkbox"/>	Vore, Carne	2011-08-05	2011-08-01	CT LUMBAR SPINE Non-Contrast (Helical)	STAT	Transport	In	Neck	Active	open
edit view <input type="checkbox"/>	Early, Bird	2011-08-07	2011-08-01	CT HEAD PERFUSION with Contrast	Routine	Transport	In	Foramen magnum to Vertex	Active	open
edit view <input type="checkbox"/>	Early, Late	2011-08-08	2011-08-01	CT HEAD STEREOTACTIC THALAMOTOMY Non-Contrast (Helical)	Routine	Walk	In	Bottom of Sella	Active	John Alcmæon
edit view <input type="checkbox"/>	Bird, Feather	2011-08-08	2011-08-01	CT HEAD Non-Contrast (Axial)	Routine	Walk	Out	Vertex	Active	John Alcmæon

A stack of papers is now replaced by a prioritized protocol worklist. Each study is weighted by a series of configurable attributes, such as urgency, date, and specialty.

Edit Top Work Order

Refresh Worklist



Converting the PaperNotebook into an Electronic Library



Protocol #: ODC		Contrast (Helical)
Indications:	Trauma to c	ation, malalignment.
Scan Location & Extent:	Axial Spiral	Magnum to bottom C4
Scan Parameters		Recon Parameters

Paper Notebook

protocol medications vitals allergies labs rad t

Protocol Name *

- Select a Value -

CT Chest with IV contrast

CT Chest without IV contrast (normal, low dose)

CT Chest Pulmonary Angiogram

High Resolution Spiral Chest CT (supine or prone)

CT Chest, abdomen and pelvis with IV and oral contrast

CT Abdomen and pelvis with IV with oral contrast

CT Chest, Abdomen and pelvis with oral contrast only

CT Abdomen and pelvis with oral contrast only

CT Abdomen and pelvis with no oral or IV contrast

Four-phase liver CT

Three-phase liver CT

CT KUB (normal, low dose)

CT IVP

CT renal mass protocol

CT adrenal mass protocol

CT pancreas mass protocol

CT aortic dissection protocol

CT thoracic aortic aneurysm

CT pre-stent evaluation

Three-phase CT post-stent

Two-phase CT post-stent

MR knee (left, right)

MR shoulder (left, right)

MR shoulder arthrogram

MR ankle (left, right)

MR hip (left, right)

MR hip arthrogram (left, right)

MR wrist (left, right)

MR wrist arthrogram (left, right)

☐ Yes

Ask if unknown

protocol medications vitals allergies labs rad exp clin rpts problem list notes rad rpts library

Logged in as Dr. John Alright

ID: 40 Name: ZZZRETFIVETWEI Patient Age: 76 DOB: 04/07/1935 Ethnicity: BLACK, NOT OF HISPANIC ORIGIN Gender: M

Loc: Room: / Bed: Transp: INPATIENT

Study: CHEST SINGLE VIEW Img Type: GENERAL RADIOLOGY Urgency: ROUTINE Due: JUL 17, 1998 Created: JUL 17, 1998@15:14:53 Mode: EDIT

ID	Name	Modality	Keywords	CTDI (mGy)	DLP (mGy cm)
WAV001	CT Chest with IV contrast	CT	1. Chest	1.22	255
WAV002	CT Chest without IV contrast (normal, low dose)	CT	1. Chest	1.22	255
WAV003	CT Chest Pulmonary Angiogram	CT	1. Chest	1.22	255
WAV004	High Resolution Spiral Chest CT (supine or prone)	CT	1. Chest	1.22	255
WAV005	CT Chest, abdomen and pelvis with IV and oral contrast	CT	1. Chest, 2. Abdomen, 3. Pelvis	1.22	255
WAV006	CT Abdomen and pelvis with IV with oral contrast	CT	1. Abdomen, 2. Pelvis	1.22	255
WAV007	CT Chest, Abdomen and pelvis with oral contrast only	CT	1. Chest, 2. Abdomen, 3. Pelvis	1.22	255
WAV008	CT Abdomen and pelvis with oral contrast only	CT	1. Abdomen, 2. Pelvis	1.22	255

Protocol List

RAPTOR Library



The Protocol Library



protocol medications vitals allergies labs dose hx clin rpts problem list notes rad rpts library									
ID	Name	Keywords	CTDIvol (mGy)		DLP (mGy cm)		Radiotracer Dose (mCi) +/-10%		Est. Eff. Dose (mSv)
			Configured Estimate	Actual Average	Configured Estimate	Actual Average	Configured Estimate	Actual Average	
RPID18	CT Chest with IV contrast	1. Chest			484	484			
RPID16	CT Chest without IV contrast (normal, low dose)	1. Chest			390	390			

- ❧ RAPTOR uses the paper notebook to build an electronic library with important protocol attributes such as RadLex Procedure ID, estimated dose, moving average of actual values and estimate effective dose
- ❧ Actual procedure notebook PDF can be linked



RAPTOR workflow



Protocol

- Active order is assigned then selected.
- Hydration, contrast, informed consent & sedation based on case.
- Radiologist, Resident or Technologist 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.



RAPTOR suggests Protocol



RAPTOR suggests a proper protocol based on order and configurable weighted keywords. The user is free to choose one or more protocols.

R Protocol | RAPTOR

protocol medications vitals allergies labs rad exp clin rpts problem list notes rad rpts library

1. Other studies for same patient

2. At risk for contrast. Patient is 60 years of age or over

3. At risk for contrast. Stage IV or Stage V Renal Impairment.

4. Diagnostic exam contraindicated due to the use of Metformin

PROTOCOL NAME

- Select -

- Select -

CT Chest with IV contrast

CT Chest without IV contrast (normal, low dose)

CT Chest Pulmonary Angiogram

CT Chest, abdomen and pelvis with IV and oral contrast

CT Chest, Abdomen and pelvis with oral contrast only

CT aortic dissection protocol

CT thoracic aortic aneurysm protocol

High Resolution Spiral Chest CT (supine or prone)

- Other Options -

CT Abdomen and pelvis with IV with oral contrast

CT Abdomen and pelvis with oral contrast only

CT Abdomen and pelvis with no oral or IV contrast

Four-phase liver CT

Three-phase liver CT

CT KUB (normal, low dose)

CT IVP

CT renal mass protocol

CT adrenal mass protocol

CT pancreas mass protocol

CT pre-stent evaluation (or R/O AAA leak)

Three-phase CT post-stent evaluation

Two-phase CT post-stent evaluation

MR knee (left, right)

MR shoulder (left, right)

MR shoulder arthrogram (left, right)

MR ankle (left, right)

MR hip (left, right)

MR hip arthrogram (left, right)

MR wrist (left, right)

Order Overview

Requested By: PROVIDER,ONEHUNDREDNINETYONE

Unknown

Unknown

Requested Study: CHEST SINGLE VIEW

Reason For Study: Not entered

Clinical Hx:

Medications

Med	At Risk ?	Status
Metformin	Y	
Coumadin		

(see medications detail)

Vitals

None Found

Allergies

Allergy Reactant	Allergy Type	Verification Date	O/H
XXXXXXXXRADIOLOGYXXXX (FREE TEXT)	OTHER	11/15/2004	
CAPTAPRIL	DRUG	06/12/1998	

(see allergies detail)

Department of Veterans Affairs

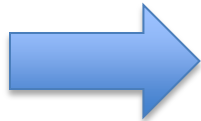
18



Configurable Contraindications



∞ RAPTOR provides a list of configurable contraindications when it detects potential duplicate studies, chronic renal impairment, an “at-risk” patient or drug interaction.



1. Please review potential duplicate studies. Below are other studies for the same patient.
2. At risk for contrast. Patient is 60 years of age or over
3. At risk for contrast. Chronic Renal Impairment.
4. Diagnostic exam contraindicated due to the use of Metformin



CONTRAINDICATIONS REQUIRING CONFIRMATION


- ☐ Acknowledgement of Please review potential duplicate studies. Below are other studies for the same patient. *
- Procedure 'NECK SOFT TISSUE' ordered NOV 16, 1994@09:30:03 CPRS status 'ACTIVE'
- Procedure 'KNEE 2 VIEWS' ordered DEC 20, 1994@16:21:01 CPRS status 'SCHEDULED'
- Procedure 'CHEST SINGLE VIEW' ordered JAN 30, 1998@14:02:31 CPRS status 'ACTIVE'
- Procedure 'ABDOMEN 1 VIEW' ordered FEB 17, 1999@11:53:46 CPRS status 'PENDING'
- ☐ Acknowledgement of At risk for contrast. Patient is 60 years of age or over *
- Age > 60
- ☐ Acknowledgement of At risk for contrast. Chronic Renal Impairment. *
- At risk for contrast. Chronic Renal Impairment.
- ☐ Acknowledgement of Diagnostic exam contraindicated due to the use of Metformin *
- At-Risk Medications for Diagnostic Exams



RAPTOR notifications



RAPTOR provides notification when a contraindication is not acknowledged or when an option is overlooked

 **RAPTOR**

Logged in as Dr. John Alright

Id: 129	Name: ZZZRETIREDSEVENTYSEVEN,PATIENT	Age: 76	DOB: 04/07/1935	Ethnicity: ASIAN OR PACIFIC ISLANDER	Gender: M
Loc: Room: / Bed:	Category: INPATIENT	Transport: WHEEL CHAIR			
Study: CT ABDOMEN W/O CONT	Img Type: GENERAL RADIOLOGY	Urgency: ROUTINE	Due: APR 05, 1995	Created: APR 05, 1995@11:59:38	Mode: EDIT

protocol medications vitals allergies labs dose hx clin rpts problem list notes rad rpts library

- Acknowledgement of Please review potential duplicate studies. Below are other studies for the same patient. field is required.
- Acknowledgement of At risk for contrast. Patient is 60 years of age or over field is required.
- Acknowledgement of At risk for contrast. Chronic Renal Impairment. field is required.
- Acknowledgement of Diagnostic exam contraindicated due to the use of Metformin field is required.
- Must select a Protocol name.
- Must select a Hydration option.
- Must select a Contrast option.
- Must select an allergy option.
- Must select a Claustrophobic option.
- Must select a Sedation option.
- Must select a Consent option.

1. Please review potential duplicate studies. Below are other studies for the same patient.
2. At risk for contrast. Patient is 60 years of age or over
3. At risk for contrast. Chronic Renal Impairment.
4. Diagnostic exam contraindicated due to the use of Metformin



Orders Overview s & Medications & Vitals Thumbnails



E

nd pelvis with IV and oral contrast

1 the hospital's radiology notebook.

NAME

il only if more than one is needed for this study.

Normal outpatient saline protocol

RediCat (450cc) during 1-2 hrs before scan

Order Overview

Requested By:	WARDCLERK,FIFTYTHREE
PCP:	Unknown
Attending:	Unknown
Requested Study:	CT ABDOMEN W/O CONT
Reason For Study:	NOT ENTERED

Medications

Med	At Risk ?	Status
Metformin	Y	
Coumadin		

(see medications detail)

Vitals

Temperature

Date	Vital	Value
04/09/2003 08:42 am	Temperature	98.6 F
	HEART RATE	None Found
04/09/2003 08:42 am	Blood Pressure	170/72 mmHg
10/22/1997 10:34 am	Height	66 in (167.6 cms)
10/05/1998 02:24 pm	Weight	220 lb (99.8 kgs)
10/05/1998 02:24 pm	Body Mass Index	36*

(see vitals detail)

Allergies



Overview provides allergies & labs “thumbnails”



SEDATION

☐ None

☐ Oral

☐ IV

☐ Unknown

☐ No

☐ Yes

ALLERGIES

Allergy Reactant	Allergy Type	Verification Date	O/H
RADIOLOGY CONTRAST DYE (FREE TEXT)	OTHER	01/07/1993	
MAYONASE (FREE TEXT)	FOOD	01/25/1993	
BANANA	FOOD	02/17/1993	
TUNAFISH (FREE TEXT)	FOOD	04/01/1994	
PEANUT BUTTER (FREE TEXT)	FOOD	02/17/1993	
JELOO (FREE TEXT)	FOOD	04/01/1994	
PENICILLIN	DRUG	12/30/1993	
AMPICILLIN	DRUG	01/01/1970	
LIDOCAINE	DRUG	01/05/1994	
MISC. MOLDS (FREE TEXT)	OTHER	11/15/2004	

10 Additional Allergies

(...more)

LABS

RENAL PANEL

Date	Creatinine	eGFR
09/20/1999 12:05 pm	1.2 mg/dL	83 mL/min/1.73 m ² (calc)
03/05/1999 09:08 am	** .4 mg/dL **	222 mL/min/1.73 m ² (calc)
02/12/1999 11:14 am	** 2.2 mg/dL **	31 mL/min/1.73 m ² (calc)

COAGULATION PANEL

Date	Test	Value
03/29/1999 01:25 pm	HCT	45 %
10/22/1997 02:53 pm	PTT	** 33.2 SEC. **

(...more)

Configurable color-coded renal & coagulation panel to highlight creatinine and calculated eGFR values

Department of Veterans Affairs



Protocol Notes – boilerplate text helpers



- ☞ To assist with efficiency, RAPTOR provides configurable text templates to assist with common note writing

BOILERPLATE TEXT HELPERS

Premedication

Methylprednisolone

Prednisone

Diphenhydramine

Emergency

Hydration

Oral

IV Outpatient

IV Inpatient

Protocol Notes

500 cc water during 2 hr before scan + 500 cc water during 2 hrs after scan

Methylprednisolone 32 mg PO @ 12 hr and 2 hr before scan
Prednisone 50 mg PO @ 13 hr, 7 hr and 1 hr before scan
Diphenhydramine 25 mg PO 1 hr before scan for either protocol above
Emergency protocol – Hydrocortisone 200 mg IV 6 hr before scan, 0 hr before scan, and 4-6 hr after scan + diphenhydramine PO or IM or IV 1 hr before scan



Radiation Dose Recording



protocol medications vitals allergies labs dose hx clin rpts problem list notes rad rpts library

Passport of radiology and imaging-related procedures

Action	Exam Date	Procedure Type	Height	Weight	BMI	CTDIvol (mGy)	DLP (mGy cm)	Radiotracer Dose (mCi)	Dose Type	Entry State
edit	6/15/2011	CT CHEST	67	200	35*	1.49*	249*	123*	Estimate	Unvalidated
edit	7/15/2011	CT CHEST	67	200	35	1.49	249	123	Direct	Validated 7/15/2011
edit	8/15/2011	CT CHEST	67	200	35*	1.49	249	123*	Estimate*	Unvalidated
edit	8/15/2011	CT CHEST	67	200	35*	1.49	249	123*	Indirect	Unvalidated

[Create New Entry](#)

- ❧ RAPTOR provides three methods (estimated, direct and indirect) to collect data so that long term dose and risk can be recorded
- ❧ Actual modality data can be entered into post-procedure note or into the dose history tab. Historical procedures can be included.
- ❧ RAPTOR provides procedure library of configurable dose values and calculates moving average for possible reduction



Examination Notes



🌀 To assist with quality transition between protocol and examination, RAPTOR provides clear reporting between what was planned and actual procedure

The diagram illustrates the data flow within the RAPTOR MDWS interface. It shows three main sections: 'HYDRATION ADMINISTERED' and 'CONTRAST ADMINISTERED' on the left, 'EXAMINATION NOTES' in the center, and 'SEDATION ADMINISTERED' and 'RADIATION EXPOSURE' on the right. Blue arrows indicate the direction of data entry and flow. Arrows point from the 'HYDRATION ADMINISTERED' and 'CONTRAST ADMINISTERED' sections to the 'EXAMINATION NOTES' section. Another arrow points from the 'EXAMINATION NOTES' section to the 'SEDATION ADMINISTERED' and 'RADIATION EXPOSURE' sections. A final arrow points from the 'Exam Complete' button to the right.

EXAMINATION NOTES

HYDRATION ADMINISTERED

Oral Type
Normal outpatient saline protocol

Oral Volume (Please write units)

IV Type

IV Volume (Please write units)

CONTRAST ADMINISTERED

Enteric Type
RediCat (450cc) during 1-2 hrs before scan

Enteric Volume (Please write units)

IV Type

IV Volume (Please write units)

Injection Date

Examination Notes
my notes

SEDATION ADMINISTERED

Type

Oral Volume

IV Type

IV Volume

RADIATION EXPOSURE

CTDI

DLP




Exam Complete



Post-Examination



☞ To assist with quality assurance between examination and interpretation, RAPTOR provides post-examination notes



POST-EXAMINATION NOTES

Datetime	Author	QA1	QA2	QA3	QA4	QA5	Notes
2012-02-21 19:24:08	DemoVAUser	Yes	No	No	No	No	kl;;
2012-02-21 19:24:58	DemoVAUser	No	No	Yes	No	No	good job
2012-02-28 11:21:54	DemoVAUser	No	No	No	No	No	no complications

QA ISSUES

- ☐ QA1
- ☒ QA2
- ☐ QA3
- ☐ QA4
- ☐ QA5

Post-Examination Notes

Please review the amount of CT dosage for this procedure.

☒ Auto Next



Secure Messaging



TOOLS Help

RAPTOR

RAPTOR Screen Concepts

Logged in as Dr. John Alcmæon

Subject *

Send To *

- Select a value -

CC

- None -

Optionally include another user of the RAPTOR system on the CC of the email message. Ask the recipient to "Reply All" when responding.

Body (Edit summary)

Protocol Notes

Scheduler - please contact Dr H. Ealth to obtain contrast approval prior to scheduling.

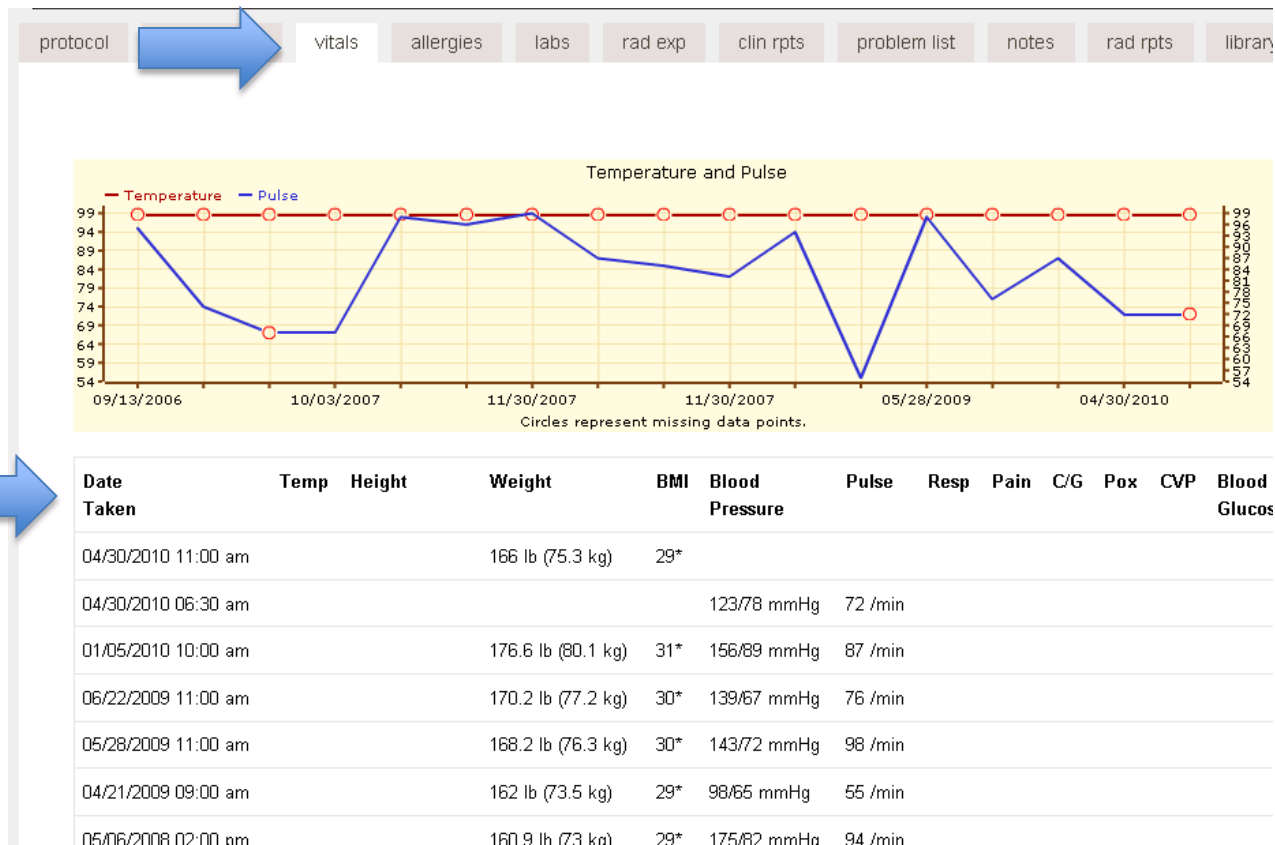
Technologists, please enter the actual type and amount of contrast used.

Local Int

Approve Request Specialist Suspend Release back to Worklist Send Email



Vitals charting & tables





Collaboration Request



SPECIALIST OPTION

☒ Request Specialist

Dr. Al Rad ▼

Dr. Rad, please review this protocol. Thanks.

☐ Auto Next

Approve Request Specialist Suspend Release back to Worklist Send Email

- ❧ RAPTOR provides ability to request collaboration with a colleague. This case will now show up at the top of the colleague's protocol worklist.
- ❧ This feature has many uses including specialists, consults and pausing your work in progress.



Allergies



RAPTOR

Logged in as Dr. John Alright

Id: 129	Name: ZZZRETIREDSEVENTYSEVEN,PATIENT	Age: 76	DOB: 04/07/1935	Ethnicity: ASIAN OR PACIFIC ISLANDER	Gender: M
Loc: Room: / Bed:	Category: INPATIENT	Transport: WHEEL CHAIR			
Study: CT ABDOMEN W/O CONT	Img Type: GENERAL RADIOLOGY	Urgency: ROUTINE	Due: APR 05, 1995	Created: APR 05, 1995@11:59:38	Mode: EDIT

protocol medications vitals allergies labs dose hx clin rpts problem list notes rad rpts library

Date	Item	Causative Agent	Signs/ Symptoms	Drug classes	Originator	Verified	Observed/ Historical
01/07/1993	RADIOLOGY CONTRAST DYE (FREE TEXT)	OTHER					
01/25/1993	MAYONASE (FREE TEXT)	FOOD					
02/17/1993	BANANA	FOOD					
04/01/1994	TUNAFISH (FREE TEXT)	FOOD					
02/17/1993	PEANUT BUTTER (FREE TEXT)	FOOD					
04/01/1994	JELOO (FREE TEXT)	FOOD					
12/30/1993	PENICILLIN	DRUG					
01/01/1970	AMPICILLIN	DRUG					
01/05/1994	LIDOCAINE	DRUG					



Labs graphing and table





Clinical Report



Loc: Room: / Bed:	Transp: INPATIENT								
Study: CT ABDOMEN W/O CONT	Img Type: GENERAL RADIOLOGY	Urgency: ROUTINE	Due: APR 05, 1995	Created: APR 05, 1995@11:59:38	Mode: EDIT				
protocol	medications	vitals	allergies	labs	clin rpts	problem list	notes	rad rpts	library

Pathology Reports

Title	Date	Details
Cytopathology Report	04/13/1995 12:00 am	details...


Surgery Reports

Title	Date	Details
CHOLECYSTECTOMY	01/01/1970 12:00 am	details...
INGROWN TOENAIL	01/01/1970 12:00 am	details...
BONE MARROE ASP/BIOPSY (Non-OR)	01/01/1970 12:00 am	details...
CHOLECYSTECTOMY	01/01/1970 12:00 am	details...
APPENDECTOMY	01/01/1970 12:00 am	details...
BILATERAL VASECTOMY	01/01/1970 12:00 am	details...
HANG NAIL REMOVAL RIGHT THUMB	01/01/1970 12:00 am	details...



Clinical Notes



 **RAPTOR**

Logged in as Dr. John Alcmæon

view 296 ZZZRETIREFIFTY,PATIENT OCT 05, 1992 OCT 05, 1992@15:37:29 KNEE 2 VIEWS

ROUTINE Transport? GENERAL RADIOLOGY

protocol


medications

vitals

allergies

labs


rad exp



notes

rad rpts

rad notebook



Title ADVANCE DIRECTIVE

Date 02/07/2002 10:02 am


Detail LOCAL TITLE: ADVANCE DIRECTIVE DATE OF NOTE: FEB 07, 2002@10:02:14 ENTRY DATE: FEB 07, 2002@10:02:14 AUTHOR: PATHOLOGY,ONE EXP COSIGNER: URGENCY: STATUS: COMPLETED This is a new Advanced Directive for this patient. has requested that he not be resuscitated in the event that he goes into respiratory distress. See attached scanned document for patient's signature. TESTING [INR] /es/ ONE PROVIDER Signed: 02/07/2002 10:02 for ONE PATHOLOGY

Title	Date	Details
PSYCHIATRIST NOTE	02/07/2002 11:40 am	details...
ADVANCE DIRECTIVE	02/07/2002 10:02 am	details...
MEDICATION REVIEW	02/17/2000 08:06 am	details...
PHARM PC	01/27/2000 08:03 am	details...
NURSING NOTE	10/28/1998 02:29 pm	RN CLINICAL NOTE details...
SHERI'S TITLE	10/28/1998 11:44 am	details...
SHERI'S TITLE	04/21/1998 03:17 pm	details...
JEANIE'S TITLE	04/09/1998 01:38 pm	details...
SHERI'S TITLE	04/09/1998 01:24 pm	details...
JEANIE'S TITLE	04/09/1998 10:42 am	details...



Radiology Reports



 **RAPTOR**

Logged in as Dr. John Alright

Id: 129	Name: ZZZRETIREDSEVENTYSEVEN,PATIENT	Age: 76	DOB: 04/07/1935	Ethnicity: ASIAN OR PACIFIC ISLANDER	Gender: M
Loc: Room: / Bed:	Transp: INPATIENT				
Study: CT ABDOMEN W/O CONT	Img Type: GENERAL RADIOLOGY	Urgency: ROUTINE	Due: APR 05, 1995	Created: APR 05, 1995@11:59:38	Mode: EDIT

protocol

medications

vitals

allergies

labs

rad exp

clin rpts

protocol notes

rad rpts

library

Title

ECHOGRAM RETROPERITONEAL LIMITED

Date

08/16/1996 02:35 pm

Detail

Procedure Name

ECHOGRAM RETROPERITONEAL LIMITED

Report Status

No Report

CPT Code

Reason For Study

Clinical HX

Impression

Report

ECHOGRAM RETROPERITONEAL LIMITED

Exm Date: AUG 16, 1996@14:35

Req Phys: PROVIDER,ONEHUNDREDNINETYONE Pat Loc: 5 WEST PSYCH (Req'g Loc)

Img Loc: ULTRASOUND



Expected Results



- ❧ Radiologist acceptance
- ❧ VA PSHCS acceptance
- ❧ Improved quality
- ❧ Improved safety of patient care
- ❧ Improved efficiency of advanced diagnostic imaging (CT, MRI, Nuclear Medicine) utilization
- ❧ Productivity gains by Radiologists & Radiology departments