

Utilizing Information Technology to Manage Radiation Exposure: Emphasis on Decision Support Systems

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*Cook Professor of Radiology,
Harvard Medical School*

President, Academy of Radiology Research

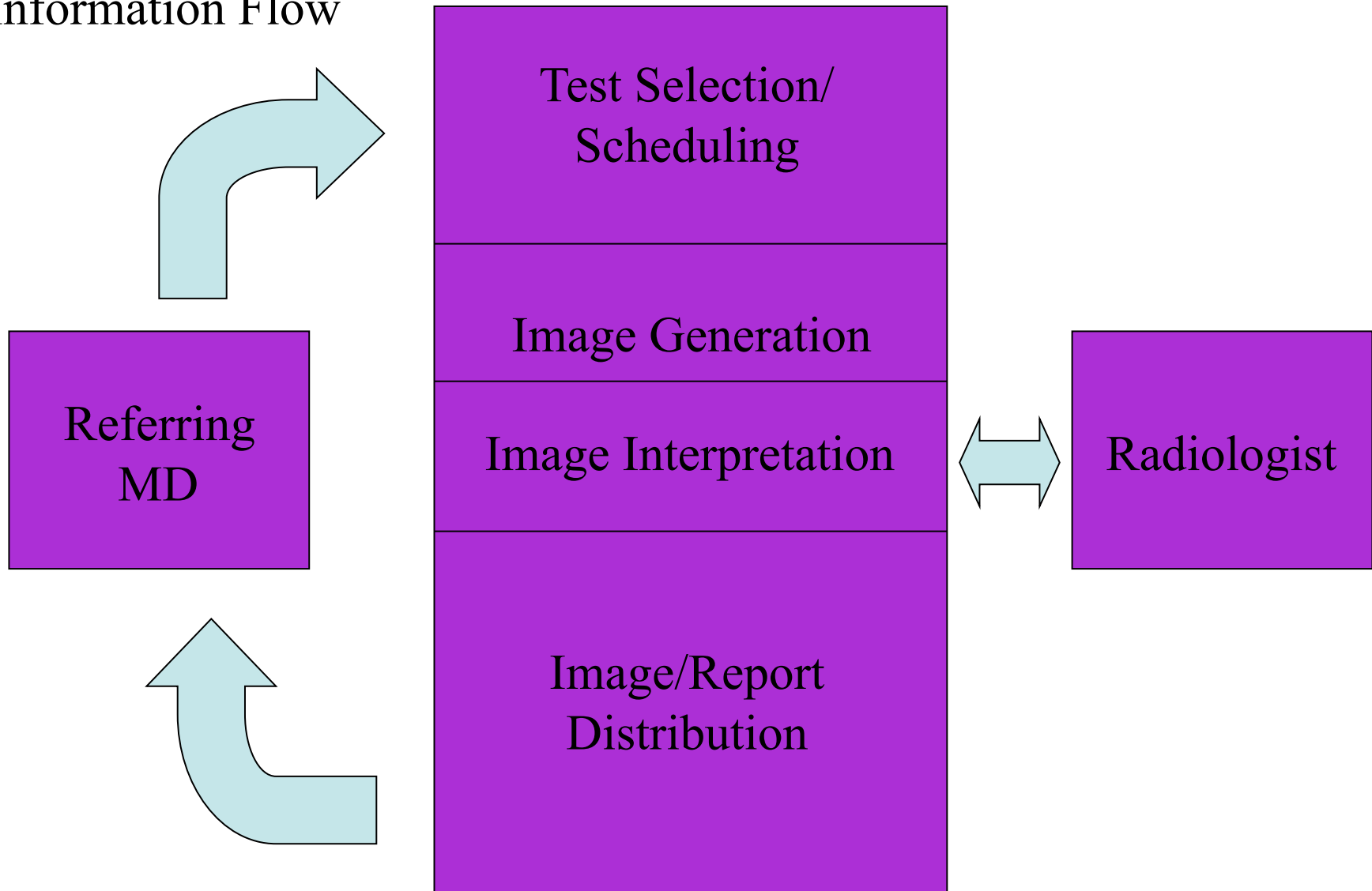
COI Disclosure

- Dr Seltzer is the President of the Brigham Radiology Research and Education Foundation, which is an equity holder in Medicalis Corporation, a manufacturer of medical decision support software tools.
- Dr Seltzer has no personal equity in Medicalis Corporation.

Utilizing Information Technology To Manage Radiation Exposure

- Before the test
- During the test
- After the test

Radiology Information Flow



Minimizing Exposure to Radiation From Diagnostic Imaging Studies

Before the Test

1.1 Use Decision Support to confirm medical necessity and eliminate duplication and waste*

1.2 Include cumulative radiation exposure in the decision

During the Test

2.1 Ensure proper protocol selection, with dose saving and monitoring tools enabled, and with ability to download standard protocols directly into imaging devices

2.2 Ensure optimum functionality of the equipment and adequate training of the operators

After the Test

3.1 Calculate actual patient exposure

3.2 Export data to EMR and national database

*also reduces unnecessary costs

Before the Test

- 1.1 Use Decision Support to confirm medical necessity and eliminate duplication and waste
 - The best ionizing radiation is no ionizing radiation

'Front End'

- Pre-authorization
 - Decision support
 - Decision support delivered within an electronic medical record
-

'Back End'

Report cards

Peer pressure

Pay for Performance

Pre-Authorization

- A vignette

<http://www.radmd.com/>

► for Physicians

[Home](#) [About Us](#) [The Imaging Problem](#) [RadMD](#)
[Results](#) [Call Center](#) [Services](#) [Patients](#) [Physicians](#)

Welcome to the National Imaging Associates Web site!

If you are looking for RadMD.com, please see the information on the right (under online tools). National Imaging Associates, Inc. is a clear leader in Radiology Benefits Management (RBM), offering the widest array of innovative solutions available.

NIA pioneered the RBM industry over the last 10 years and has consistently led the nation in providing quality improvement and economic benefit to our client partners. We were the first in the industry to receive URAC HIPAA Privacy and Security Accreditations and JCAHO/NCQA's Privacy Certification for Business Associates. NIA is also URAC Accredited and NCQA Certified in UM. We are fully certified to handle all of the Protected Health Information we receive in the course of our operations.

We continue to maintain a steadfast commitment to improving the quality of radiology care for patients, providing value added services to physicians, and delivering dramatically improved financial results to our healthplan partners.

We hope you will find this Website provides useful information about how the NIA solution is working for better healthcare in America. [more»](#)





The NIA Call Center



ient Call Center is one of the most important elements of any Radiology Benefits Management program. This is where, through a simple phone call to our trained customer service and medical staff, physicians receive quick consultation on the radiology modalities they wish to utilize. **We think you will agree that NIA's Call Center is the best in the business.**

Call Center Features

- **Highly trained customer service and medical professionals handle calls.** Board-certified radiologists and other physicians, along with Authorization Representatives, Registered Nurses, and LV Nurses staff the NIA Call Center.
- **Efficiency Assured by NIA Algorithms.** Call Center efficiency is enhanced dramatically through the use of NIA's proprietary, evidence-based decision support guidelines, known as algorithms.

Here's how the algorithms work: As Call Center staff ask a few scripted questions about the utilization request and input answers into our proprietary software and database systems, the algorithms automatically adjust to prompt the appropriate additional questions - leading to approval or consultation with our radiology experts. The initial process takes no more than four minutes.
- **Expert consultation.** About one-third of the consultation calls we handle are transferred to our board-certified radiologists and other specialists for peer-to-peer consultation with the ordering physician.
 - If case requests are "denied," our radiologists recommend an alternative procedure
 - No authorization requests are ever denied without a concerted effort to discuss the matter with the ordering physician

RAD MD

24/7 online access for imaging facilities and health plans to NIA's near-real-time authorization and consultation services.

[»for more information...](#)

Log In

New User

Search

Authorization Tracking:

Need Help?

877-80-RADMD
(877-807-2363)

877-80-RADMD

(877-807-2363)

- Thank you for calling Magellan's IT support center
- If you would like to speak to a technician, press 1 or stay on the line
- If you would like to leave a message for the IT support team, please press 2
- If you are a Magellan work at home employee, please press 4

Pre-Authorization

- VERY, VERY UGLY

Decision Support

Knowledge Base

- Published evidence
- ACR appropriateness criteria

Problem: Knowledge, without a facile
‘delivery system’

Case Example

Decision Support Within An Electronic Medical Record at BWH

Knowledge, with a facile 'delivery system'

Decision Support Within An Electronic Medical Record Pre-requisites

- Electronic Medical Record
- Computerized Decision Order Entry
- Knowledge Base
- Delivery Tools

'Analog Era'

| R E F E R R I N G P H Y S I C I A N | B W H | |
|---|---|--|
| | REQUESTING PHYSICIAN FIRST & LAST NAME | |
| | TELEPHONE NUMBER AND BELLBOY NUMBER | |
| | PHYSICIAN SIGNATURE <i>William Legaty</i> PHYSICIAN I.D. # | |
| | SEND REPORT TO ADDRESS OTHER THAN LOCATION CODE | |
| | LOCATION CODE | |
| | RADIOLOGY REQUEST FORM - PLEASE USE ONE FORM PER DEPARTMENTAL SECTION | |
| | DESIGNATE SECTION: <input type="checkbox"/> GENERAL DIAGNOSTIC <input type="checkbox"/> NUCLEAR MEDICINE <input type="checkbox"/> MAGNETIC RESONANCE <input type="checkbox"/> ULTRASOUND <input type="checkbox"/> COMPUTED TOMOGRAPHY <input type="checkbox"/> ANGIOGRAPHY/INTERVENTIONAL | |
| | DATE OF REQUEST MO. DAY YR | |
| | HOW PATIENT WILL BE TRAVELING AMB <input type="checkbox"/> W / C <input type="checkbox"/> BED <input type="checkbox"/> STR <input type="checkbox"/> W / O2 <input type="checkbox"/> | |
| ADDRESS CITY: STATE: ZIP: PHONE # HMO # INSURANCE CARRIER(S) AND POLICY NUMBER: 1. 2. 3. | | |
| EXAMINATION(S) CANNOT BE PERFORMED UNTIL ALL ITEMS ARE ANSWERED | | |
| 1. EXAMINATION(S) REQUESTED: a. <i>BODY SCAN</i> b. c. d. | | |
| 2. HISTORY, FINDINGS, DIAGNOSIS: | | |
| 3. QUESTIONS TO BE ANSWERED: <i>I WANT IT!</i> | | |
| 4. STAT REPORT? <input type="checkbox"/> Y <input type="checkbox"/> N IF YES, LIST TEL. # BB # | | |
| 5. ALLERGIES OR PRECAUTIONS? | | |
| 6. IS PATIENT PREGNANT? <input type="checkbox"/> Y <input type="checkbox"/> N | | |
| 7. THIS INFORMATION IS MANDATORY ONLY FOR OB/GYN EXAMS DATE OF LMP MO. DAY YR GESTATIONAL AGE | | |
| SHADED AREA FOR RADIOLOGY USE ONLY | | |
| FILMS # EXAMINATION PERFORMED EXAM CODE | | |
| TECHNOLOGIST: DATE MO. DAY YR | | |
| FOR NUCLEAR MEDICINE USE ONLY | | |
| ISOTOPE: FORM: DOSE: TIME INJ.: TIME SCAN: | | |
| PRELIMINARY REPORT: | | |
| RADIOLOGIST'S SIGNATURE: | | |

BRIGHAM AND WOMEN'S HOSPITAL
75 Francis Street
Boston, Massachusetts 02115

DEPARTMENT OF RADIOLOGY - OUTPATIENT APPOINTMENT

AM PM

LMR DMA14 - Microsoft Internet Explorer provided by Partners HealthCare System

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Real.com Links

Test,Test,M.D. PG RK020

00000000 (BWH) 05/05/1947 (55 yrs.) F NHA

Select Desktop Patient Chart: Summary Custom Reports Admin Sign Resource

Sticky Notes Radiology Family and Social History

VITAL SIGNS: 11/15/2002 BP N/A P N/A RR N/A Temp 98.6 Ht N/A Wt N/A

| Medications | Problems | Procedures | Allergies |
|-------------------------------|-----------------------------|----------------------|---------------|
| Id-sti571 100 x1 | R/o headache [N] | Cluster headache [N] | Bactrim |
| Colace 100MG 1 TID | Free textddd [N] | | Erythromycins |
| Id-zd1869 10 1X | Ho ankle [N] | | Penicillins |
| Tylenol 325MG 1 Q4H PRN | Ankle fracture [N] | | |
| Vicodin es 1 Q6H | ? sprained ankle [N] | | |
| Warfarin sodium 5MG 1 QPM | Just an all around jerk [N] | | |
| Albuterol nebulizer 1.25 Q4H | Migraine headache [N] | | |
| Panwarfin 5MG 1 QPM | Abscess [N] | | |
| Tramadol 50MG 1 Q6H | Head trauma [N] | | |
| Benazepril 10MG 1 QD | Asthma | | |
| Amytal 15 BID | | | |
| Zyrtec 10MG 1 QD | | | |
| Malarone 250 2222 | | | |
| Tylenol 325MG As Directed ... | | | |
| Zofran 8MG 1 Q8H | | | |
| Warfarin sodium Alternating | | | |
| Prozac 20MG 1 QD [N] | | | |
| Prilosec 20MG 1 QD | | | |
| Prednisone 20MG 1 QAM | | | |
| Free form 100 qid | | | |
| Prilosec 10MG 1 Q2H | | | |
| Tylenol es 650MG 1 Q4H | | | |
| Tylenol 325MG 1 PRN | | | |

Digital Era

1 Reminder for This Patient

- Patient is 50 years old or older, recommend Influenza vaccination

Exam Selection

Order Placement

| | | | |
|--|---------------|------------------------------|--------------------------|
| Patient Name: Kim, Jenny K. | | RADVISE MRN: M0020333 | |
| Birth Date: December 28, 1972 | Age: 29 years | Gender: Female | Phone Number: 6175552222 |
| Ordering Physician: Hill, Cleon | | Payer: Tufts (HMO) | |
| Created By: N/A | | Ordering Site: N/A | |

Radiology

Lab

Select an exam in one of the following 3 ways:

1. Exam Selection

| | | | | |
|--------------|--------------|------------------|-----------|----------|
| Xray | CT | MRI | US | Iluc Med |
| GI/GU/Fluoro | Vascular I/P | Non-vascular I/P | Screening | |

2. My Custom Orders

| |
|--------------------------|
| Mammography/Bone Density |
|--------------------------|

3. My Exam Shortcuts

| |
|----------|
| MRI Head |
|----------|

Action Required

Unread Reports

Changed Orders

Unscheduled Orders

Unsigned Orders

Print

Logoff



Patient

Search for New Patient

Worklist

Create Order

Custom

Search for Orders/Reports

Help

Schedule Order

Result View

Create Letter

Print

Logoff

Note by Partners: Welcome to Percipio!

Exam Selection

Order Placement

| | | | |
|--|---------------|--------------------------|---------------|
| Patient Name: OETEST, BRIDGET | | BWH MRN: 15783376 | |
| Birth Date: January 1, 1967 | Age: 36 years | Gender: Female | Phone Number: |
| Ordering Physician: Hallam, Allison | | Payer: Tufts | |
| Created By: N/A | | Ordering Site: N/A | |

Select an exam in one of the following **3** ways:**1** Exam Selection

| Xray | CT | MRI | US | Nuc Med |
|-------------------------|----|--------------|-----------|------------------|
| Portable Chest | | | | |
| Chest PA and lat | | | cular I/P | Non-vascular I/P |
| Chest PA view | | | | Screening |
| Chest decubitus | | | | |
| Mammography | | | | |
| KUB (supine) | | | | |
| KUB and upright | | Shoulder | | |
| Pelvis, AP | | Humerus | | |
| Pelvis and hips | | Elbow | | |
| Knee | | Radius/ulna | | |
| Extremities | | Wrist | | |
| C-spine series(2 views) | | Hand | | |
| C-spine series(7 views) | | Femur | | |
| T-spine | | Tibia/fibula | Left | |
| L-spine | | Ankle | Right | |
| Other | | Foot | Bilateral | |



Percipio - Microsoft Internet Explorer provided by Partners HealthCare System

Xray Ankle Right Indications

Order Placement

| | |
|---|-----------------------------------|
| Patient Name: OETEST, BRIDGET | BWH MRN: 15783376 |
| Birth Date: January 1, 1967 | Age: 36 years |
| Gender: Female | Phone Number: |
| Ordering Physician: Hallam, Allison | Payer: Tufts |
| Exam: Xray Ankle Right | Order ID: 3084662 |
| Created By: N/A | Ordering Site: TEST PRACTICE |

Submit

Signs and Symptoms: (Select one or more)

| | |
|---|--|
| <input checked="" type="checkbox"/> Pain/Tenderness | <input type="checkbox"/> Unable to bear weight |
| <input type="checkbox"/> Swelling | <input type="checkbox"/> Erythema |
| <input type="checkbox"/> Limited ROM | <input type="checkbox"/> Ulceration |
| <input type="checkbox"/> Deformity | <input type="checkbox"/> Fever |
| <input type="checkbox"/> Open fracture | <input type="checkbox"/> Asymptomatic |

Other:

| | |
|--|---|
| Relevant History: (Select one or more) | Differential Diagnosis: (Select one or more) |
| <input checked="" type="checkbox"/> Blunt trauma less than or equal to 10 days | <input type="checkbox"/> New fracture |
| <input type="checkbox"/> Blunt trauma greater than 10 days | <input type="checkbox"/> Degenerative disease |
| <input type="checkbox"/> Penetrating trauma | <input type="checkbox"/> Loosening |
| <input type="checkbox"/> Prior fx | <input type="checkbox"/> Osteomyelitis |
| <input type="checkbox"/> S/P joint replacement | <input type="checkbox"/> Malignancy |
| Known malignancy ▶ | <input type="checkbox"/> Assess healing/change |
| Known arthropathy ▶ | <input type="checkbox"/> Foreign body |
| <input type="checkbox"/> Diabetes | <input type="checkbox"/> Non union/Delayed union |

Patient

Worklist

Custom

Help

Search for New Patient

Create Order

Search for Orders/Reports

Schedule Order

Result View

Create Letter

Print

Logoff

Local intranet

Ottawa Ankle Rules

Percipio - Microsoft Internet Explorer provided by Partners HealthCare System

medicalis

Patient: Search for New Patient
Worklist: Create Order
Custom: Search for Orders/Reports
Help: Schedule Order, Result View, Create Letter, Print, Logoff

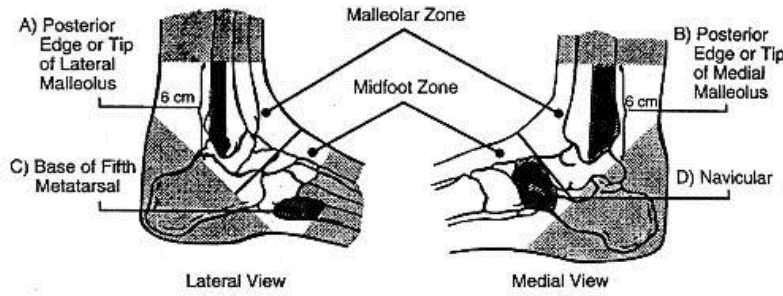
Ordering Physician: **Hallam, Allison** Payer: Tufts
Exam: **Xray Ankle Right** Order ID: 3084662
Signs and Symptoms: **Pain/Tenderness**
Relevant History: **Blunt trauma less than or equal to 10 days**
Created By: N/A Ordering Site: TEST PRACTICE

Decision Support

With reference to the diagram below please answer the following questions:

Was the patient able to bear weight both immediately following the injury and currently in the exam room (minimum 4 steps unaided)? ☐ Yes ☐ No

Is there bony tenderness at the posterior edge or tip of either malleolus? ☐ Yes ☐ No



The diagram illustrates the ankle joint from lateral and medial perspectives. It defines three zones for clinical assessment: the Malleolar Zone, the Midfoot Zone, and the Base of Fifth Metatarsal Zone. Specific points of interest are labeled: A) Posterior Edge or Tip of Lateral Malleolus, B) Posterior Edge or Tip of Medial Malleolus, C) Base of Fifth Metatarsal, and D) Navicular. A 6 cm scale bar is provided for each view.


Copyright: Elsevier Health Sciences

Source: A study to develop clinical decision rules for the use of radiology in acute ankle injuries. Stiell JG, Greenberg GH, McKnight RD, Nair RC, McDowell I, Worthington, JR. *Annals of Emergency Medicine* 1992; 21: 384-390.

This information is presented to assist you in providing care to your patients. It is your responsibility to exercise your independent medical knowledge and judgment in providing what you consider to be in the best interest of the patient.

Local intranet

Percipio - Microsoft Internet Explorer provided by Partners HealthCare System



BWH Ordering Physician: Hallam, Allison Site: TEST PRACTICE [Logoff](#)

Note by Partners: Welcome to Percipio!

Decision Support**Order Placement**



| | | | |
|---|---------------|-----------------------------------|---------------|
| Patient Name: OETEST, BRIDGET | | BWH MRN: 15783376 | |
| Birth Date: January 1, 1967 | Age: 36 years | Gender: Female | Phone Number: |
| Ordering Physician: Hallam, Allison | | Payer: Tufts | |
| Exam: Xray Ankle Right | | Order ID: 3084662 | |
| Signs and Symptoms: Pain/Tenderness | | | |
| Relevant History: Blunt trauma less than or equal to 10 days | | | |
| Created By: N/A | | Ordering Site: TEST PRACTICE | |

Decision Support

Based on the information you have provided ankle films are *unlikely* to be helpful. Studies have demonstrated that in patients with similar characteristics, NO ankle fractures were found.

This information is presented to assist you in providing care to your patients. It is your responsibility to exercise your independent medical knowledge and judgment in providing what you consider to be in the best interest of the patient.

[Reset Order](#)[Ignore](#)

[More Info](#)
[Feedback](#)

Search for New Patient

Create Order

Search for Orders/Reports

Schedule Order

Result View

Create Letter

Print

Logoff

Local intranet





Patient

Worklist

Custom

Help


Search for New
Patient
Create Order
Search for
Orders/Reports
Schedule Order
Preview
Schedule
Result View
Create Letter
Print
Logoff

BWH Office Staff: Siddiqi, Sameer

Site: Primary Care Assoc of Norwood

[Logoff](#)

Decision Support

Order Placement

| | | | |
|--|---------------|--|--------------|
| Patient Name: OETEST, TEST | | ND MRN: N/A | |
| Birth Date: May 5, 1947 | Age: 55 years | Gender: Female | Payer: Tufts |
| Order Information | | | |
| Ordering Physician: Schneider, Louise M.D. | | | |
| Exam: Diagnostic Mammography | | Order ID: 3005884 | |
| Created By: N/A | | Ordering Site: Primary Care Assoc of Norwood | |

Decision Support

Duplicate orders, ordered within the past 3 months, are listed below.

| Id | MRN | Patient | Physician | Exam | Order Date | Scheduled Date | Site | Status |
|-------------------------|-----|--------------|------------------------|------------------------|-----------------------|----------------|------|---------|
| 3004810 | N/A | OETEST, TEST | Schneider, Louise M.D. | Diagnostic Mammography | May 13, 2002 8:16 AM | N/A | N/A | Created |
| 3004840 | N/A | OETEST, TEST | Schneider, Louise M.D. | Diagnostic Mammography | May 13, 2002 12:50 PM | N/A | N/A | Created |

Reset Order

Ignore

[More Info](#)[Feedback](#)





Worklist

Custom

Help

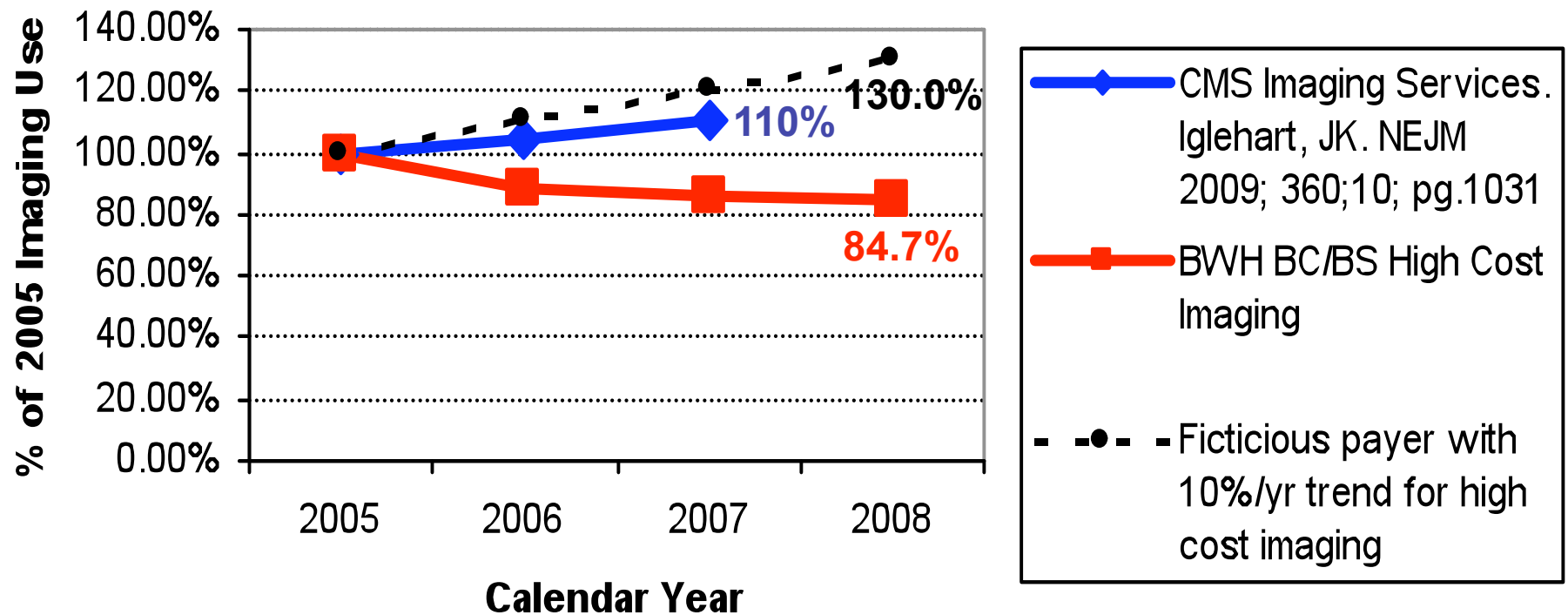

Logoff

 [More Info](#)

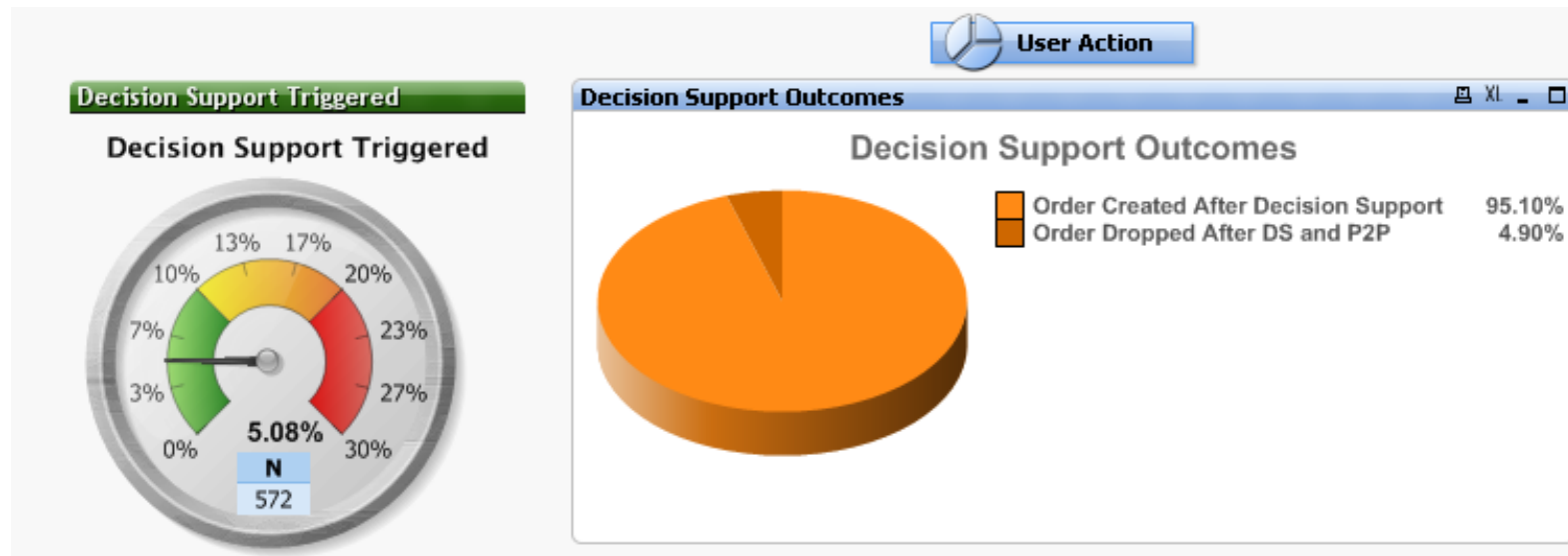
 [Feedback](#)

Trends in Use of High Cost Imaging <with HIT> at BWH

(As a % of 2005 imaging use)



Decision Support Use now > 98% of all orders



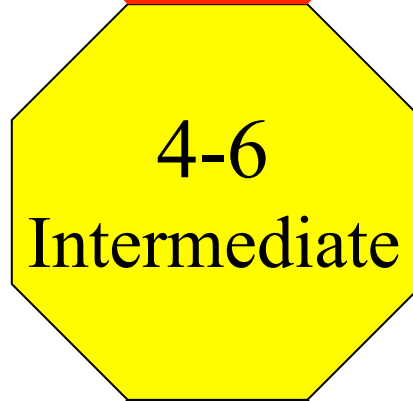
Fringe Benefits:

- All orders MD signed
- Indication 'hard wired' to ICD-9 code
- Easy to create utilization reports

“Appropriateness” Values

Another excellent
CPOE system
At MGH

Courtesy:
Dan Rosenthal, MD



Spine MR is indicated for the clinical indications provided



Alternate procedures to consider:

| | |
|----|-------|
| CT | X_Ray |
| 5 | 2 |

Additional Information:

[When imaging is helpful for Back Pain](#)

[Patient Information on Back Pain](#)

Options:

- [Proceed](#) with exam
- [Cancel](#) or select new exam
- [Change](#) indications and resubmit

EXAM REQUESTED Pick only ONE of the Following

- ☐ Cervical: Musculoskeletal Interpretation ☐ Cervical: Neuroradiology Interpretation
☐ Thoracic: Musculoskeletal Interpretation ☐ Thoracic: Neuroradiology Interpretation
☒ L-S: Musculoskeletal Interpretation ☐ L-S: Neuroradiology Interpretation
☐ Limited complete (for mets) ☐ Sacrum
☐ SI Joints

At least one box MUST be selected from either of the following groups

SIGNS / SYMPTOMS

- | | |
|--|--|
| <input type="checkbox"/> Abnormal extremity reflexes | <input type="checkbox"/> Abnormal extremity sensation |
| <input checked="" type="checkbox"/> Back pain | <input type="checkbox"/> Back pain following trauma |
| <input type="checkbox"/> Back pain, prior surgery | <input type="checkbox"/> Extremity weakness (paraplegia) |
| <input type="checkbox"/> Mass or lump | <input type="checkbox"/> Neck pain |
| <input type="checkbox"/> Neck pain following trauma | <input type="checkbox"/> Radiculopathy |
| <input checked="" type="checkbox"/> Sciatic leg pain | |

KNOWN DIAGNOSES (NOT Rule/out!)

- ☐ Cauda Equina syndrome

Congenital spine malformation (specific)

Patient Name: **ROSENTHAL, DANIEL**

MRN: **2219795**

Ordering Physician: **Rosenthal, Daniel Ira**

Proceed with Order

Cancel Exam

Spine MR has low utility for the clinical indications provided



Alternate procedures to consider:

X_Ray CT

6

2

Additional Information:

[When imaging is helpful for Back Pain](#)

[Patient Information on Back Pain](#)

Options:

- [Proceed](#) with exam
- [Cancel](#) or select new exam
- [Change](#) indications and resubmit

EXAM REQUESTED Pick only ONE of the Following

- ☐ Cervical: Musculoskeletal Interpretation ☐ Cervical: Neuroradiology Interpretation
☐ Thoracic: Musculoskeletal Interpretation ☐ Thoracic: Neuroradiology Interpretation
☒ L-S: Musculoskeletal Interpretation ☐ L-S: Neuroradiology Interpretation
☐ Limited complete (for mets) ☐ Sacrum
☐ SI Joints

At least one box MUST be selected from either of the following groups

SIGNS / SYMPTOMS

- ☐ Abnormal extremity reflexes ☐ Abnormal extremity sensation
☒ Back pain ☐ Back pain following trauma
☐ Back pain, prior surgery ☐ Extremity weakness (paraplegia)
☐ Mass or lump ☐ Neck pain
☐ Neck pain following trauma ☐ Radiculopathy
☐ Sciatic leg pain

KNOWN DIAGNOSES (NOT Rule/out!)

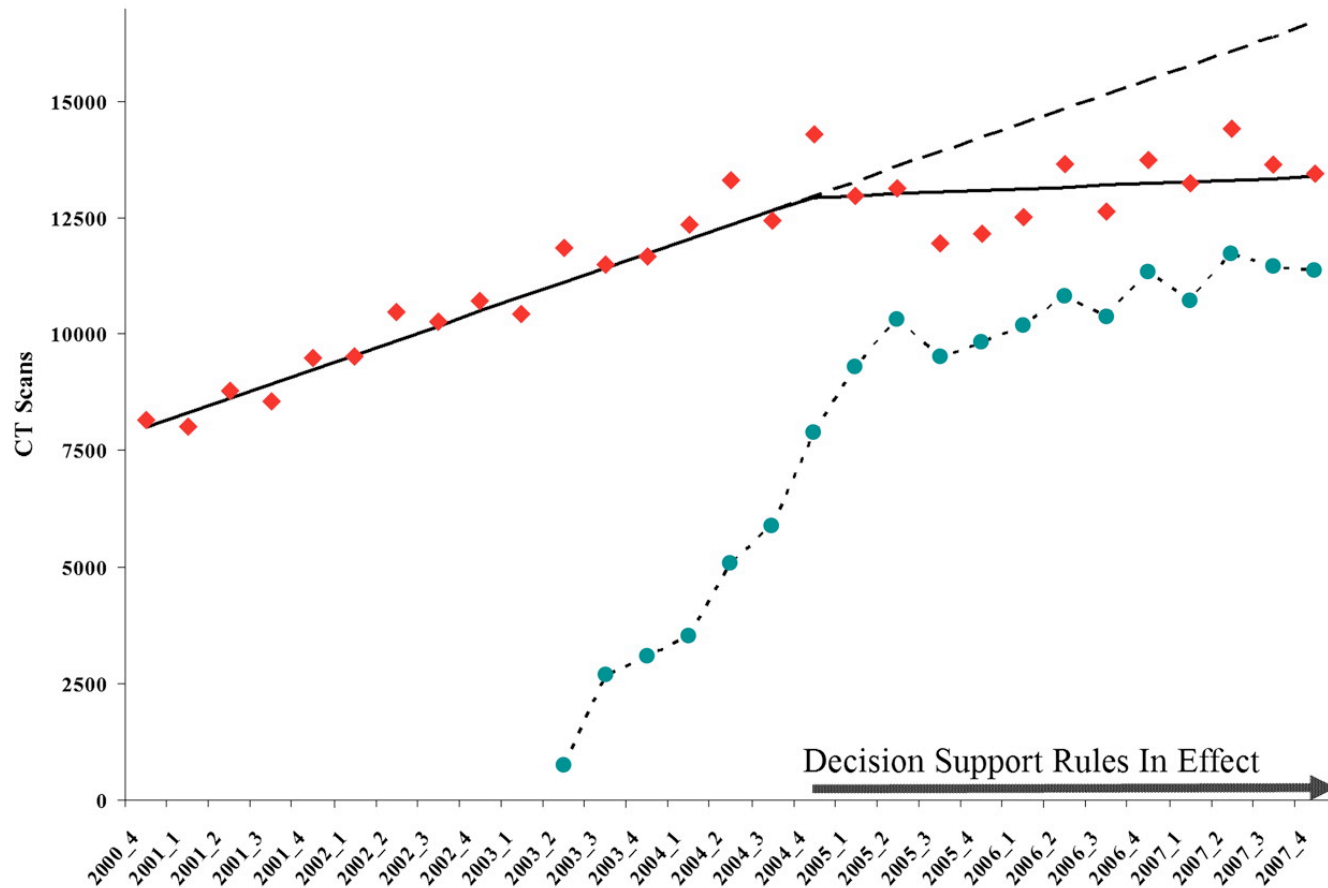
☐ Cauda Equina syndrome

Congenital spine malformation (specify)

☐ Degenerative disease with spinal cord compression

☐ Degenerative disease without spinal cord compression

Figure 4: Scatterplot of outpatient CT examination volumes (y-axis) per calendar quarter (x-axis) represented by red diamonds



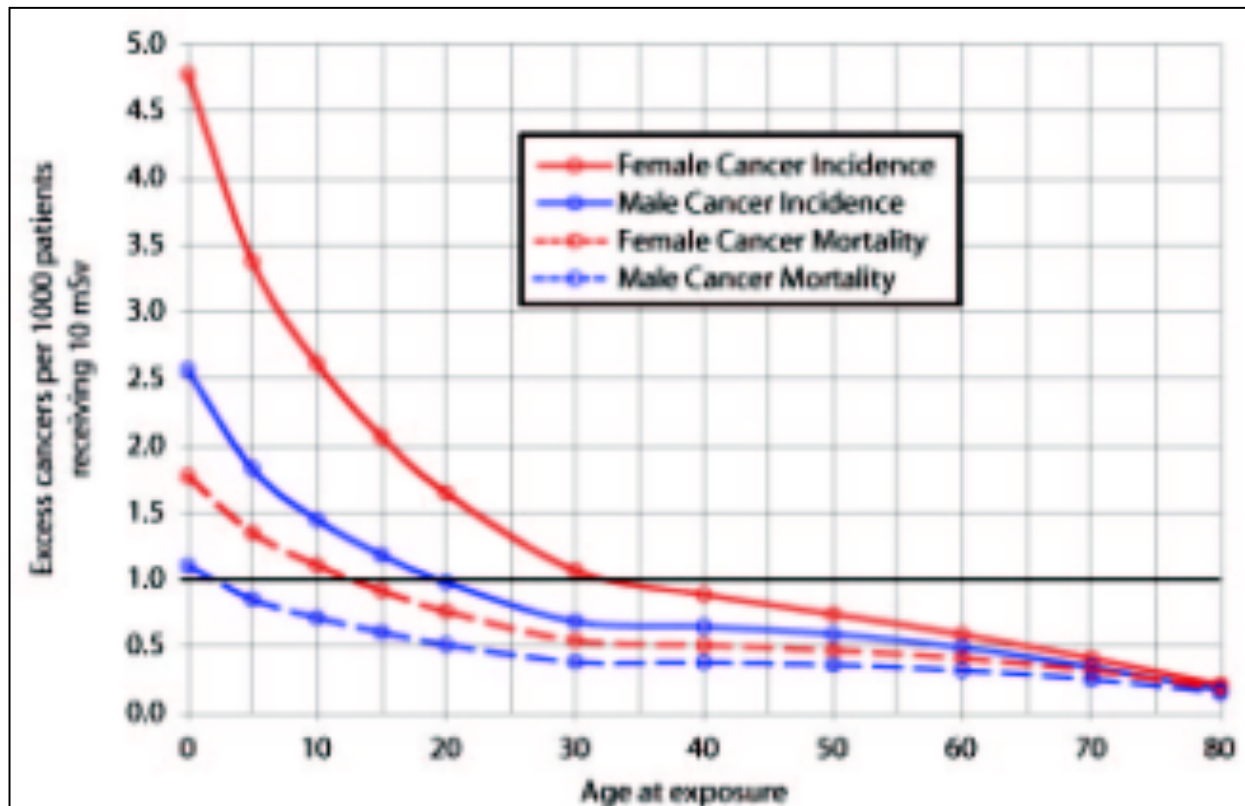
Sistrom, C. L. et al. Radiology 2009;251:147-155

Radiology

Before the Test

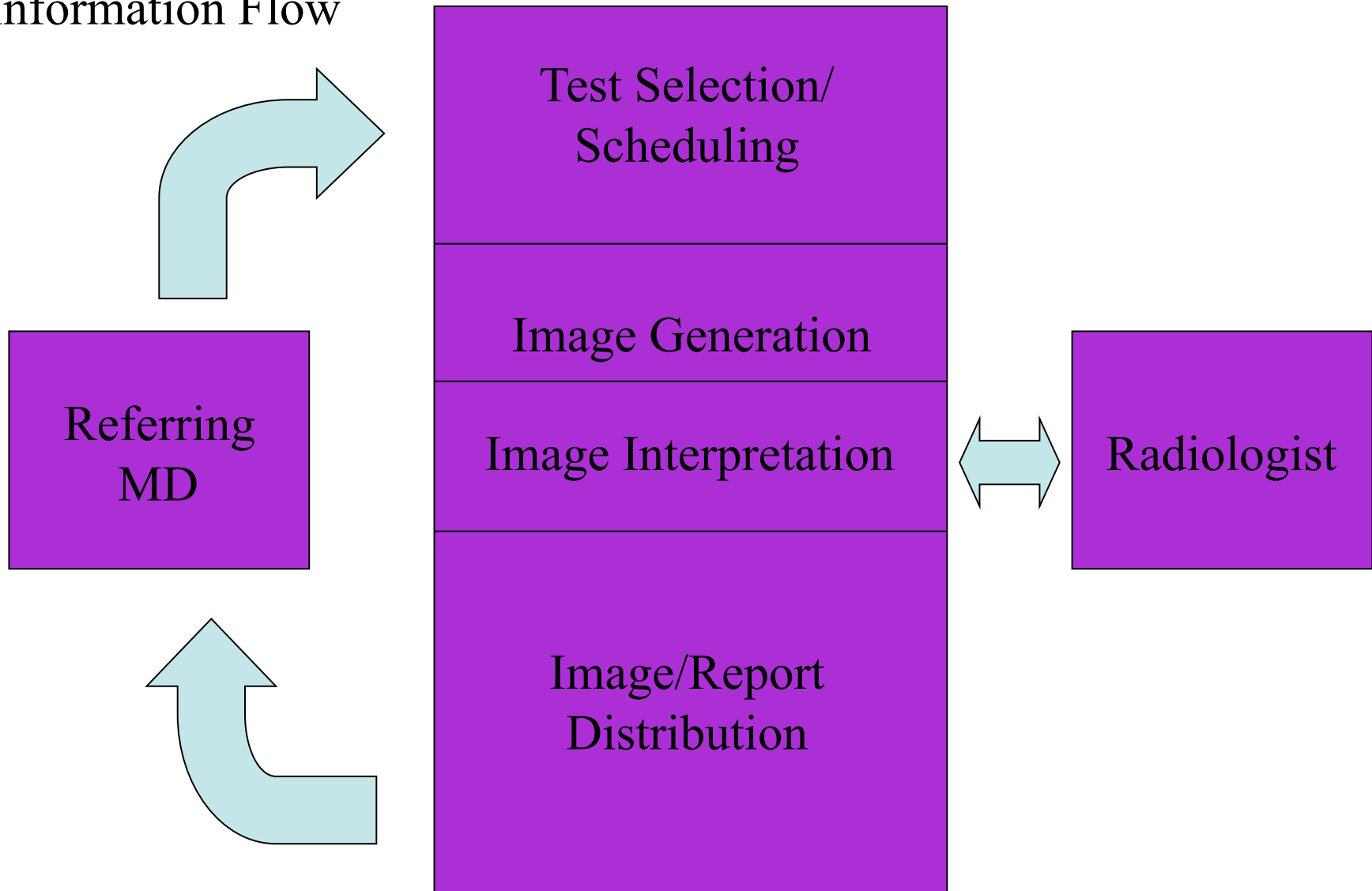
- 1.1 Use Decision Support to confirm medical necessity and eliminate duplication and waste
- 1.2 Include cumulative radiation exposure in the decision

Cumulative Radiation Exposure Risk Assessment



Sodickson A et al. Radiology, April, 2009

Radiology Information Flow



During the Test

2.1 Ensure proper protocol selection, with dose saving and monitoring tools enabled, and with ability to download standard protocols directly into imaging devices

2.2 Ensure optimum functionality of the equipment and adequate training of the operators

Protocols Portal - RadXT

Medicalis Rad XT - radxt.partners.org

Protocol Folders Search Save Save and Next Marchello, Dana @ Partners Health Care Partners Health Care workgroup / Protocol workflow layout

Send Feedback BICS Medication Order Entry eGFR Calculator

BWH MSK Spine (14) CRD - 850 CT (1) CRD - All (19) BWH Neuro Interv... BWH Neuro MRI (58) New Order Protoco... New Order Protoco... 14

OETEST, CATHY [CT Abdomen/Pelvis General Intraabdominal] OETEST, CATHY Clinical Summary

Patient Information

Patient Name: OETEST, CATHY **MRN:** BWH 0000091
Birth Date: 01-01-1980 **Age:** 31 years **Gender:** F
Ordering Provider: TEST, DOC MD

Order Information

Order ID: 15884332 **Accession #:** n.a.
Exam Ordered: CT Abdomen/Pelvis General Intraabdominal
Scheduled Date: 02-22-2011 3:00 PM
Created Date: 02-22-2011 8:37 AM
Order Status: Scheduled **Scheduling Preference:** n.a.
Modifier(s): n.a.

Clinical Information

Sx Pain (Specify: RLQ)
Nausea/vomiting

Ddx Visceral injury
Appendicitis

Ds 1) Do any of the following apply?
• History of kidney disease as an adult
• Renal Insufficiency
• Current dialysis treatment
• Polycystic Kidney Disease
• Diabetes Mellitus treated with oral hypoglycemic and/or insulin
• Multiple Myeloma or other paraproteinemia syndromes or diseases
• Lupus or other collagen vascular diseases
No
2) Is the patient currently taking Cox-1 or Cox-2 inhibitors nonsteroidal anti-inflammatory drugs (e.g. naproxen, celecoxib, ibuprofen)?
No

Allergy

| Type | Name | Reaction Type | Source | Entered By | Date |
|-------|---------------|--------------------|-------------|------------|-------------------|
| OTHER | Bupivacain... | Anaphylaxis | BICS - BICS | NONE,M.D. | 01-25-2011 8:4... |
| DRUG | Aspirin | Arrhythmia or E... | BICS - BICS | NONE,M.D. | 01-25-2011 5:4... |
| DRUG | Erythromycins | Bronchospasm, ... | BICS - BICS | CROPP,K... | 01-25-2011 6:2... |
| DRUG | NSAIDs | Anemia, Throm... | BICS - BICS | CROPP,K... | 01-25-2011 6:2... |
| DRUG | ACE Inhibitor | Rash | BICS - BICS | CROPP,K... | 01-25-2011 6:2... |

Lab

| Ab... | Test Description | Value | Date | Units | Normal R... |
|-------|------------------|----------|-------------------|-------|-------------|
| | CREATININE | 1.1 | 10-27-2005 5:3... | mg... | 0.7-1.3 |
| | eGFR | NOT DONE | 10-27-2005 5:3... | | |

Imaging Priors

| R. | R. | I. | Exam | Completed Date | Accession | Source |
|----|----|----|------------------------------|----------------|------------|---------|
| | | | MRI Ankle Right | 09-27-2005 | 7160458 | PERCPIO |
| | | | MRI Ankle Right | 09-07-2005 | 7161381 | PERCPIO |
| | | | CT Femur Left | 09-07-2005 | 7161439 | PERCPIO |
| | | | Transthoracic Echo Full Echo | 04-15-2010 | EVS0242474 | PERCPIO |
| | | | Transthoracic Echo Limited | 04-15-2010 | EVS0242492 | PERCPIO |
| | | | CT Head Standard | 01-09-2009 | 9497643 | PERCPIO |
| | | | CT Abdomen/Pelvis Gener... | 11-04-2010 | 00000000 | PERCPIO |

Protocol Order Audit

start 2 Micro... 7 Inter... SmarTer... Medicalis... 2 Firefox 3 Micro... untitled -... 8:37 AM

Medicalis Rad XT - radxt.partners.org

Protocol Folders

Search

Save

Save and Next

Send Feedback

BICS Medication Order Entry

eGFR Calculator

Marchello, Dana @ Partners Health Care

Partners Health Care workgroup / Protocol workflow layout

BWH MSK Spine (14)

CRD - 850 CT (1)

CRD - All (19)

BWH Neuro Interve...

BWH Neuro MRI (58)

New Order Proto...

New Order Proto...

14

OETEST, CATHY [CT Abdomen/Pelvis General Intraabdominal]

OETEST, CATHY Clinical Summary

Clinical Information

Sx

Pain (Specify: RLQ)

Nausea/vomiting

Ddx

Visceral injury

Appendicitis

Ds

1) Do any of the following apply?

History of kidney disease as an adult

Renal Insufficiency

Current dialysis treatment

Polycystic Kidney Disease

Diabetes Mellitus treated with oral hypoglycemic and/or insulin

Multiple Myeloma or other paraproteinemia syndromes or diseases

Lupus or other collagen vascular diseases

No

2) Is the patient currently taking Cox-1 or Cox-2 inhibitors nonsteroidal anti-inflammatory drugs (e.g. naproxen, celecoxib, ibuprofen)?

No

3) Is the patient currently taking Metformin or a metformin-containing combination drug such as Avandamet, Glucophage, Glucophage XR, Glucovance, Glucovange, or Metaglip ?

No

Protocol Information

This exam requires 1 protocol.

☐ Flag for review

CT Abdomen/Pelvis Endocrine Gastrointestinal Lymphatic Repro...

Assign to Another Folder

Assigned Protocol:

Assigned IV Contrast:

Protocol Order

Audit

Allergy

| Type | Name | Reaction Type | Source | Entered By | Date |
|-------|---------------|--------------------|-------------|------------|-------------------|
| OTHER | Bupivacain... | Anaphylaxis | BICS - BICS | NONE,M.D. | 01-25-2011 8:4... |
| DRUG | Aspirin | Arrhythmia or E... | BICS - BICS | NONE,M.D. | 01-25-2011 5:4... |
| DRUG | Erythromycins | Bronchospasm, ... | BICS - BICS | CROPP,K... | 01-25-2011 6:2... |
| DRUG | NSAIDs | Anemia, Throm... | BICS - BICS | CROPP,K... | 01-25-2011 6:2... |
| DRUG | ACE Inhibitor | Rash | BICS - BICS | CROPP,K... | 01-25-2011 6:2... |

Lab

| Ab... | Test Description | Value | Date | Units | Normal R... |
|-------|------------------|----------|-------------------|-------|-------------|
| | CREATININE | 1.1 | 10-27-2005 5:3... | mg... | 0.7-1.3 |
| | eGFR | NOT DONE | 10-27-2005 5:3... | | |

Imaging Priors

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start

2 Micro...

7 Inter...

SmarTer...

Medicalis...

2 Firefox

4 Micro...

untitled ...

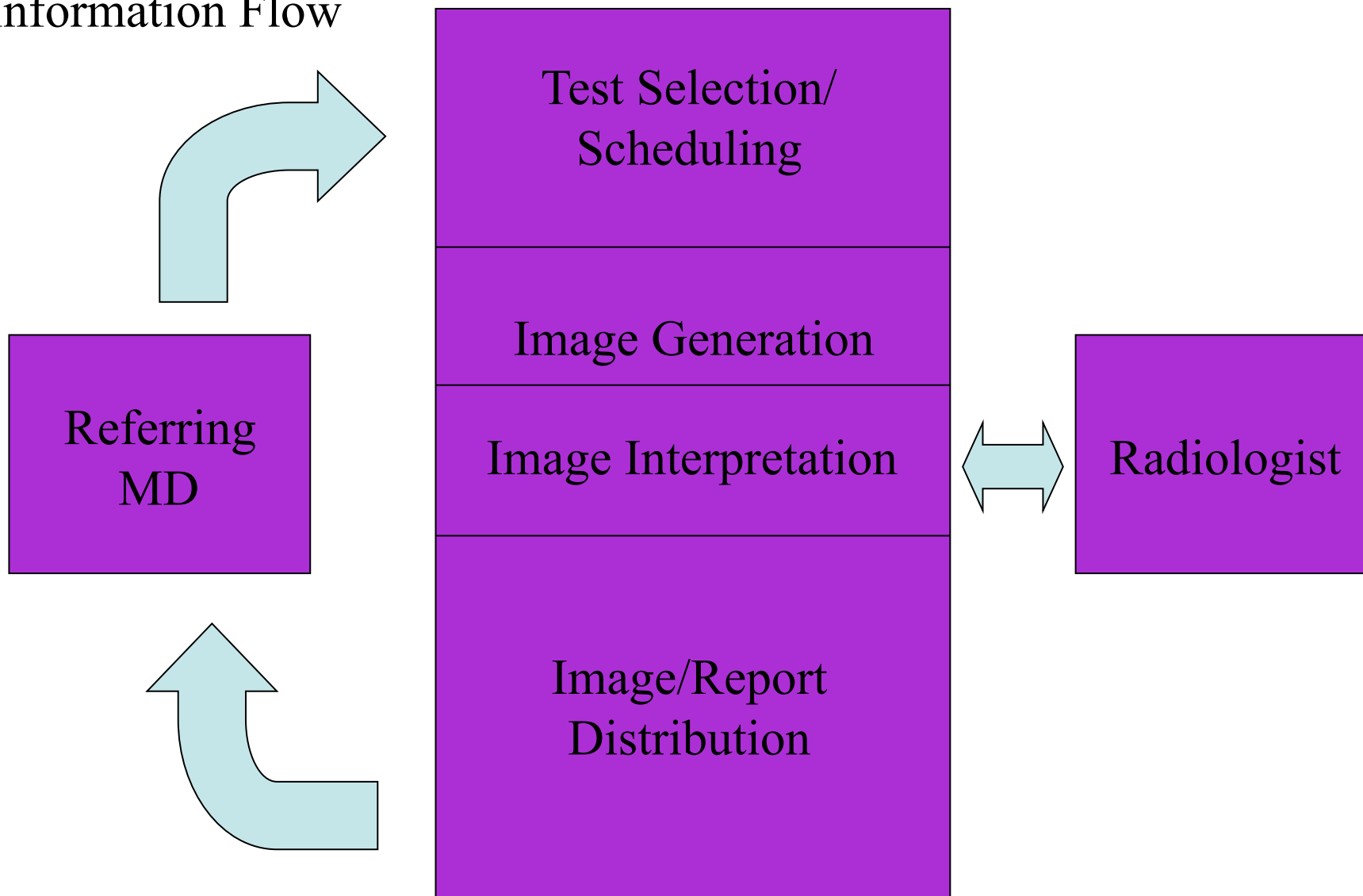
8:38 AM

During the Test

2.1 Ensure proper protocol selection, with dose saving and monitoring tools enabled, and with ability to download standard protocols directly into imaging devices

2.2 Ensure optimum functionality of the equipment and adequate training of the operators

Radiology Information Flow

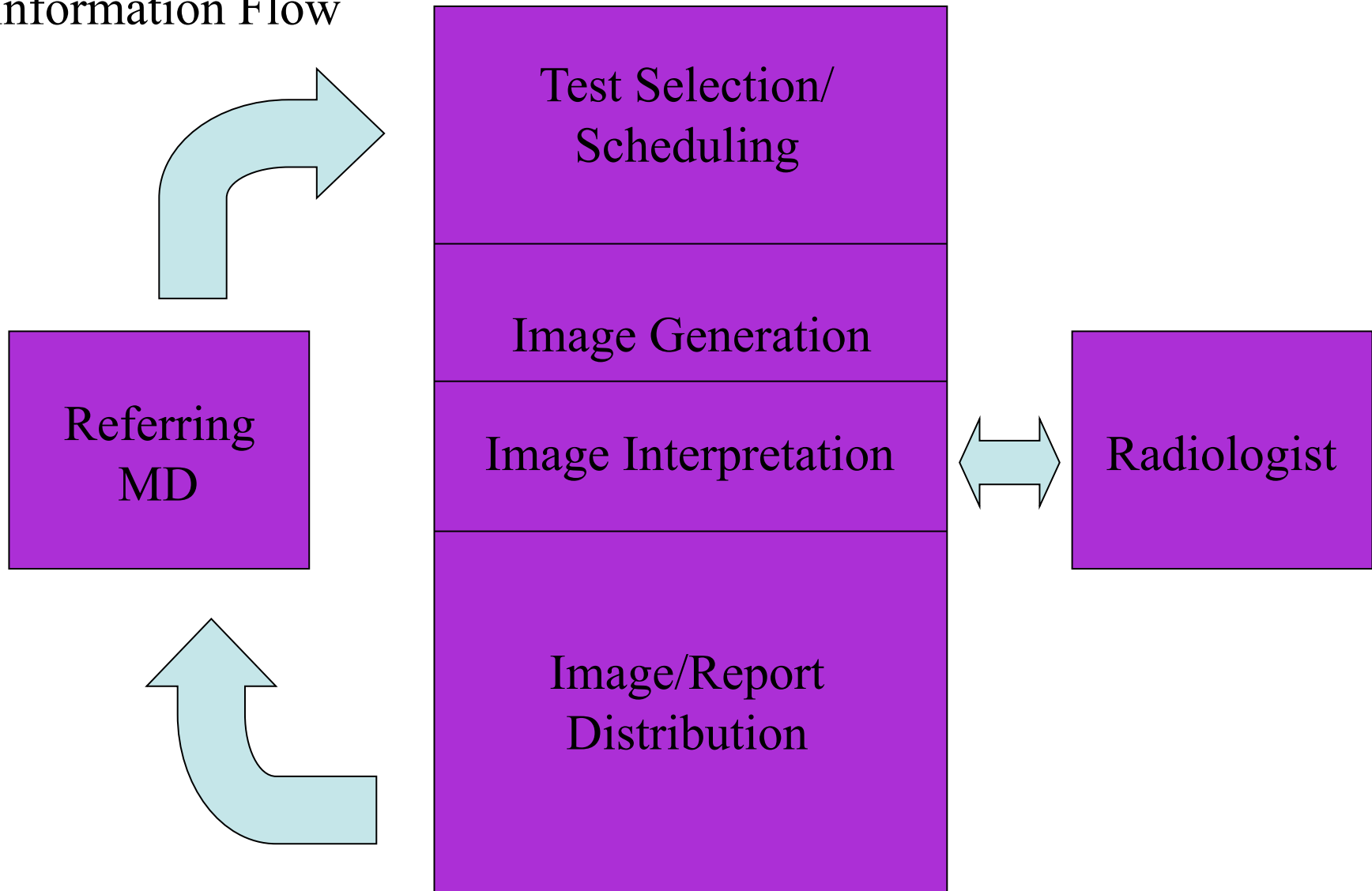


After The Test

3.1 Calculate actual patient exposure

3.2 Export data to EMR and national database

Radiology Information Flow



Test Selection, Ordering by CPOE with Decision Support: Benefits

- Reduces errors
- Applies evidence-based methods to test selection
- Optimizes reimbursement
 - ‘hard wires’ ICD-9, CPT, referring MD into billing system
 - May ‘escape’ insurer-imposed pre-certification programs
- Facilitates transfer of clinical data to radiologist
- Facilitates transfer of results (esp abnormal results to the referrer)

Test Selection, Ordering by CPOE with Decision Support: Costs

- Expensive infrastructure
- Adoption by
 - Referrers
 - Radiologists
- Reducing your own revenue in a FFS system

Conclusions

- Information Technology, particularly EHR, CPOE and DS Systems can be utilized to advantage to manage radiation exposure
 - Ensuring proper test selection
 - Ensuring proper protocol selection
 - Ensuring proper exam execution
 - Ensuring delivery of results
 - Measuring actual exposure
 - Updating HER
 - Informs selection of next test
- HITECH Act may provide meaningful catalyst

Conclusions

- Worth Investment!
 - Deployment
 - Improvement
 - Evaluation