

GE Healthcare

TiP-TV™ Training in Partnership Program Supplement and Test for Imaging Professionals Leadership Education Evaluating Workflow

Publication Date: August 7, 2008

Revised: August 4, 2008

1.0 ASRT-approved Category A CE Credit



imagination at work

TABLE OF CONTENTS

Program Summary	3
Continuing Education Credit	4
Introduction.....	5
Workflow Mechanics	6
Workflow—User Dynamics.....	8
Workflow—An Academic View	9
Workflow—Return on Investment.....	11
Appendix A: Presenters	13
Appendix B: Resources	14
Appendix C: Post-Test	15

Program Summary

This page provides an overview of the program content and learning objectives. Please refer to the Table of Contents for a detailed list of the topics covered. We encourage you to file a copy of this Program Summary and the Table of Contents with your continuing education certificate. We also recommend that you provide a copy of this information to your manager as a record of your educational achievement.

Program Description

Process improvement initiatives are designed to upgrade the quality of services by evaluating as many organizational procedures as possible. This program will focus on the importance of looking carefully at workflow, not just at the departmental level, but over other areas of the organization, in order to tighten up processes, enhance employee and customer satisfaction, increase turnaround time, and improve the bottom line.

Program Objectives

By the end of this program, the viewer should be able to:

1. Recognize the benefits of picture archiving and communication systems/radiology information systems (PACS/RIS) technology, as applied to medical imaging departments.
2. Identify the differences between Health Level 7 (HL7), Digital Imaging and Communications in Medicine (DICOM), and Integrating the Healthcare Enterprise (IHE) standards.
3. Analyze the effect of initiation and completion of PACS transition on the end user.
4. Describe the tangible and intangible benefits associated with PACS/RIS transition, to include return on investment (ROI).
5. Interpret the results of an academic study designed to assess the impact of PACS/RIS technology.

Target Audience

Course objectives for this program specifically target radiology administrators and supervisory personnel. Other managers, supervisors, and medical personnel may also benefit from viewing this program.

NOTE: While not limited to this audience group, the technical content is most effective when applied to people with this training. Regardless of your imaging specialty, you may apply for continuing education credit. Refer to the Continuing Education Credit page for additional information.

Continuing Education Credit

1.0 ASRT-approved Category A CE Credit

Continuing Education Credit

After viewing the TiP-TV video presentation and reading this program supplement, please complete the required online CE credit activities (test and feedback form). The TiP-TV test measures knowledge gained and/or provides a means of self-assessment on a specific topic. The feedback form provides us with valuable information regarding your thoughts on the program's quality and effectiveness.

Online Process for CE Credit



TiP-TV satellite broadcast subscribers can go online to obtain CE credit – quickly and easily!

hls.gehealthcare.com

1. View the entire video presentation – this is a requirement for obtaining CE credit. This supplement is **not** intended to replace watching the video presentation.
2. Go to the GE Healthcare Learning System (HLS) web site at **hls.gehealthcare.com** and complete the feedback form.
3. Complete the post-program test.
 - ♦ You have up to three attempts to successfully complete the test with a minimum passing score of 75% (ASRT-approved programs) or 80% (SNM-approved programs).
 - ♦ The test must be completed without aids or assistance of any kind; this is an **individual effort**.
4. Upon successful completion of the online CE information, you can instantly print a certificate.

Continuing Education Credit Eligibility – Important Notice!

A GE Healthcare TiP-TV course may be available in several different formats, such as, but not limited to, a broadcast, online web course, or videotape. You may only be able to receive CE credit once for a particular course, regardless of the format in which it was viewed.

If you have already received CE credit for this course, you are encouraged to contact your CE certification organization (ARRT, ARDMS, NMTCB, etc.) to determine if you can repeat this course for CE credit.

Thank you for choosing GE Healthcare as your continuing education partner. We hope you will join us for other TiP-TV programs in the future. For more details and program schedule information, please visit our education web site (**www.gehealthcare.com/education**).

If you have a question or comment on the program content, please send a message to:
PSTIPApps-ct@med.ge.com

Introduction

A work environment that is optimally designed is one in which work flows from one place to another in a steady, smooth, continuous, and accurate manner. If workflow is designed properly, the way work is conducted will benefit the company, benefit users of the system, and will make a favorable impact on customer satisfaction. This program examines workflow as it pertains to medical imaging and at how it subsequently branches out to points well beyond any individual department.

Currently, optimized workflow is largely dependent on software programs and hardware. Workflow software continues to be a leader in the marketplace, due to its ability to provide an automated and controlled work system, and, overall, a more accurate and productive organizational effect. In addition, the emergence and deployment of the Internet and individual Intranets have made an impact as workflow management applications have been placed in service.

Of great benefit in an automated system is the ability to better control processes, as there will be better access to information in the form of reports that tell managers how these processes are working. Of additional benefit is the potential for a tighter and more controlled billing structure.

There are very tangible benefits to be appreciated if the old way of doing things is carefully reviewed and opportunities for incorporation of new dynamics to operational systems are considered. There are also intangible benefits associated with workflow revisions that can be of equal or even greater importance.

This program explores these elements, and more, as workflow is examined from differing vantage points. Several guests offer commercial, consultant, user, and academic perspectives on the subject. The first topic is the mechanical aspects of workflow.

Workflow Mechanics

The interrelationships of three workflow components are the main focus of this program. The three components are: radiology information systems (RIS), healthcare information systems (HLS), and picture archiving and communication systems (PACS). In the program video, Randall Swearingen, RIS consultant and President of Swearingen Software, Inc. in Houston, Texas, comments.

- Early RIS configuration.
- Basic features of early systems.
- Automation of manual tasks.
- Media storage size.
- Communication of workflow.
- MPPS (modality performed procedure step) command.
- Technologist worklist.
- Open items.
- Radiologist worklist.
- Voice recognition.
- Efficiency.

Notes:

Radiology information systems link to healthcare information systems through communication protocols that have not always been standardized. Mr. Swearingen comments.

- HL7 (Health Level 7) transfers data to other systems.
- DICOM (Digital Imaging and Communications in Medicine) transfers images to other systems.
- IHE (Integrating the Healthcare Enterprise) is an umbrella that covers both HL7 and DICOM. It helps them work as effectively as possible.
- It is much harder for a PACS to exist without an RIS than it is for an RIS to exist without a PACS.

Notes:

DICOM, MPPS, HL7, and IHE are important connectivity options, but their parameters do not always guarantee interoperability. In the program video, Herman Oosterwijk, PACS expert and President of OTech, Inc. in Aubrey, Texas, comments.

- DICOM itself changes often.
- There is no assurance that a workstation, having received an image, will display an image properly.
- There are variant applications that may be needed to display images or data properly.
- DICOM does not always guarantee interoperability.

Notes:

One of the beneficial aspects pertaining to DICOM standards is that when these standards are created, each vendor is required to develop a DICOM conformance statement to help users define compatibility issues. Following the compatibility line of thought, Mr. Oostervijk was asked if there are other communication standards to be considered.

- CCOW (clinical context object workgroup) is important for desktop integration and is part of HL7.
- CCOW allows other applications to be added.

Notes:

Workflow—User Dynamics

This section explores the dynamics associated with placing a PACS in a regional healthcare organization as told by Connie Slomczewski, Director of Radiology Services at Wheaton Franciscan Healthcare – All Saints in Racine, Wisconsin. In the program video, Ms. Slomczewski discusses short- and long-term goals, as well as the sequence of the roll-out process.

- Short-term goal – provide clinicians and radiologists better care options.
- Long-term goal – replace current archiving systems.
- Hard copy removal over time.

Notes:

The choice of a PACS administrator is an important step in the process and is not an easy task. Once that selection is made, the next important step is getting staff members involved in the process. In the case followed here, the PACS administrator chosen was a registered radiologic technologist with a magnetic resonance imaging (MRI) background. Subsequently, the process of reviewing the old workflow model and developing the prospective new model was begun, as was the training necessary pursuant to the new model. In the program video, Ms. Slomczewski comments.

- Training differs according to function within the department.
- Need to define workflow of each job and then design training for that job.
- Used train-the-trainer model.
- Identify master trainers.
- Vendors were involved in radiologist training.
- Changing the process flow to adapt to the PACS environment was the biggest challenge.
- Digital modalities, such as computed tomography (CT) and magnetic resonance (MR), were the easiest to transition.
- Transition from analog systems to digital systems was the biggest challenge.

Notes:

Workflow—An Academic View

Professor Abraham Seidmann, from Simon Graduate School of Business at the University of Rochester in New York, conducted an analysis of the overall impact of PACS/RIS technology. An interview with Professor Seidmann begins with an explanation of the focus of the project and proceeds through the challenges, preliminary results, and tangible, as well as intangible, benefits.

- Rate of improvement.
- Learning curve.
- Benefits hard to detect initially.
- Twelve to fifteen months to fully realize effects.
- A continuous process of leveraging the system to gain results.
- Analytic framework of the study.
- It is important to document the process before, during, and after the transition.
- Evaluation of how performance was affected.
- What was the process of implementation?
- Deficit Reduction Act (DRA) pressure.
- Increased volume and increased revenue per volume counteracted DRA to some degree.
- More revenue was realized because more information was available.
- One-hundred percent of charges were captured.
- Marketing benefits, improved physician satisfaction.
- Eighty percent reduction in report turnaround time.
- Storage and cost of film reduced.
- Intangible benefits included satisfaction of staff, happy physicians, better quality, and faster throughput.

Notes:

In terms of customer and staff satisfaction and the overall impact of PACS/RIS implementation, Professor Seidmann was asked to what extent these factors should be considered prior to launch. Professor Seidmann also talked about how report turnaround time and radiologist productivity were affected.

- Prior to launch, there was much dissatisfaction with the time it took to accomplish tasks.
- Dissatisfaction was reduced dramatically with PACS/RIS.
- Confidence levels were improved as PACS/RIS became more familiar.
- The capacity to do more work was increased with PACS/RIS.
- Staff members exhibited pride in working in a sophisticated environment.

- Referring physicians were very pleased with the ability to view reports via the Internet.
- Report turnaround time goes down, but individual radiologist interpretation time may go up.
- What happens with old films? What is their importance?
- Radiologists do not seem to be interested in old films if they are more than two years old.

Notes:

Workflow revision provides a great opportunity to improve processes in tandem with the implementation of PACS/RIS. Professor Seidmann talked about that and also about improved charge capture.

- Lean Six Sigma was part of the methodology used in process revision.
- Batch reading on a film viewer is a thing of the past with PACS/RIS systems.
- Not only is charge capture improved, there is also the capability to acquire radiologist productivity data.

Notes:

Workflow—Return on Investment

What kind of return on investment can be expected from PACS/RIS implementation? The program video provides three perspectives, beginning with Mr. Swearingen and Ms. Slomczewski, and followed by Professor Seidmann, who discusses the analytic tools used to determine value in his study.

Randall Swearingen

- Return on investment can be difficult to measure at times.
- The industry standard for lost charges is approximately 4%.
- Cost of pre-printed forms can be reduced dramatically.
- Wait time reduction.
- Physician goodwill improved (intangible benefit).
- Legal exposure is reduced due to increased information capture.
- Health Insurance Portability and Accountability Act (HIPAA) compliance is easier with PACS/RIS.

Notes:

Connie Slomczewski

The return is largely not measured in dollars.

Notes:

Abraham Seidmann

- Used principle component analysis and econometric models.
- A workflow simulation analysis tool was created.
- Everyone needs to know how PACS/RIS technology adds value, something that is not always tangible.

Notes:

In the program video, final comments regarding what was learned in the user environment and how this might be looked at going forward from the academic perspective are discussed by Ms. Slomczewski and Professor Seidmann.

Connie Slomczewski

- Need key personnel involved from the outset.
- Need, at least, personnel from information systems, radiology operations, administration, radiologist staff, and the referring physician group.
- PACS is not just a radiology tool, it affects everyone.
- You need to know, from the outset, what the expectations and capabilities of the system are.
- You need to structure processes within the capabilities of the system.
- You must understand the impact on users, not all will like the transition.

Notes:

Abraham Seidmann

- Expect improved billing, coding, and charge capture.
- Expect improved diagnostic accuracy.
- There will be better matching of records and information.
- Expect morale and general satisfaction to improve.
- Expect improvement in available options.
- The sky is the limit.

Notes:

Appendix A: Presenters

Roger Beck, M.S., R.T. (R)(CT)

CT/Leadership TiP-TV Program Manager
GE Healthcare

Randall Mattingly, R.T. (R)(N)(QM), CNMT

Imaging Solutions Executive
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Herman Oosterwijk

President
OTech, Inc.
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Abraham Seidmann

Professor
Simon Graduate School of Business
University of Rochester
Rochester, New York

Connie Slomczewski

Director, Radiology Services
Wheaton Franciscan Healthcare – All Saints
Racine, Wisconsin

Randall Swearingen

President
Swearingen Software, Inc.
Houston, Texas

Appendix B: Resources

Electronic Resources

Center for Information Technology Leadership: <http://www.citl.org>

Connecting for Health: <http://www.connectingforhealth.org>

The Healthcare Information and Management Systems Society (HIMSS): <http://www.himss.org>

The Healthcare Information and Management Systems Society (HIMSS) – Integrating the Healthcare Enterprise: http://www.himss.org/ASP/topics_ihe.asp

The Nationwide Health Information Network: <http://nhinwatch.com>

TiP-TV Leadership Series:

http://www.gehealthcare.com/usen/education/proff_leadership/products/leadership_education.html

NOTE: The Internet is an ever-evolving environment and links are subject to change without notice.

Appendix C: Post-Test

LMS Course Number: 3331

To be eligible for CE credit, you MUST view the video presentation first. Then complete the post-test on the GE Healthcare Learning System (hls.gehealthcare.com) by the due date listed online

1. Early radiology information systems were primarily set up to _____.
 - a. track workflow
 - b. automate redundant tasks
 - c. automate charge capture
 - d. be connected with the hospital information system
2. DICOM _____ commands are sent by a modality to signify when an examination begins and when it is completed.
 - a. HL7
 - b. IHE
 - c. MPPS
 - d. CCOW
3. One worklist, to include the front desk, technologists, and radiologists, is sufficient for all areas of the department to operate smoothly.
 - a. True
 - b. False
4. HL7 communication protocols were developed to transfer _____ to other information systems.
 - a. data
 - b. images
 - c. only charge codes
 - d. only patient demographics
5. DICOM is a communication protocol that transfers _____ to other information systems.
 - a. charge codes
 - b. data
 - c. images
 - d. patient demographics
6. A radiology information system typically deals with _____ protocols.
 - a. ICD
 - b. DICOM
 - c. IHE
 - d. HL7
7. A PACS typically deals with _____ protocols.
 - a. HL7
 - b. DICOM
 - c. IHE
 - d. CCOW

8. _____ is an umbrella that covers both RIS and PACS, providing a standard under which they can both be used conjunctively.
- IHE
 - DICOM
 - HL7
 - GPS
9. Using DICOM guarantees connectivity between devices, but does not guarantee _____.
- image transfer
 - the DICOM protocol standard
 - interoperability with another device such as a workstation
 - a DICOM worklist
10. _____ is a standard that allows the user to integrate multiple applications, such as voice recognition, laboratory results, and desktop integration.
- DICOM
 - HL7
 - IHE
 - CCOW
11. According to Ms. Slomczewski, the entire roll-out of a PACS system in her organization took approximately _____ months.
- 6
 - 9
 - 12
 - 16
12. According to Ms. Slomczewski, when a PACS training plan was designed for their department, the first thing they looked at was /were _____.
- key job components within each area of the department
 - the age of the employee
 - whether the employee was computer-literate
 - the amount of responsibility each employee could reasonably assume
13. According to Ms. Slomczewski, the development of a PACS training plan hinged upon defining the _____ today, as well as for the future, and then determining what kind of training needed to be done.
- degree of resistance
 - patient volume
 - total revenue expected
 - workflow
14. According to Ms. Slomczewski, the transition from analog to digital systems was the largest challenge that her organization faced in PACS implementation.
- True
 - False
15. The PACS/RIS research project conducted by Professor Seidmann reported the change in examination turnaround time to be _____% better than at the project's outset.
- 10
 - 17
 - 25
 - 37

16. Professor Seidmann stated that the increase in _____ helped to offset the deleterious financial effects of the DRA.
- physician satisfaction
 - workflow efficiency
 - revenue per patient volume
 - patient satisfaction
17. According to Professor Seidmann, _____% capture of all charges for service was appreciated after the implementation of PACS/RIS.
- 80
 - 90
 - 98
 - 100
18. Professor Seidmann's research indicated that review of previous films is not usually performed by radiologists if the studies are older than _____ years.
- two
 - three
 - four
 - five
19. Using key Lean Six Sigma elements will help to reduce _____ as much as possible.
- study times
 - variability
 - charge loss
 - stress
20. According to Mr. Swearingen, in non PACS/RIS environments, the standard for lost charges stands at about _____% per year.
- 2
 - 4
 - 8
 - 10