Adapting the Universal Protocol in a Diagnostic Radiology Department to prevent wrong-patient, wrong-site, and wrong-examination events

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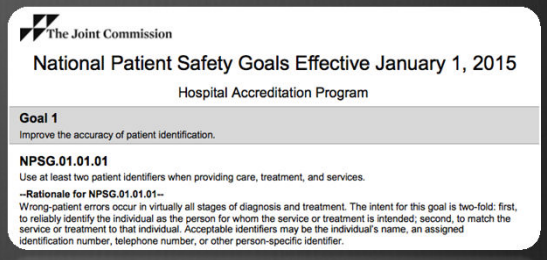
Introduction

- Because of the unacceptably high rate of patient misidentification in health care, The Joint Commission (TJC) continues to recommend accurate patient identification as the #1 National Patient Safety Goal since 2003.[1]
- TJC reviewed 152 *sentinel events* related to wrong-patient, wrong-site, and wrong-procedure events in 2011 alone.[2]
- The Pennsylvania Patient Safety Authority received 652 reports in Radiology in 2009 related to wrong-patient (30%), wrong-site (5%), wrong-side (15%) and wrong-procedure (50%) events across all modalities.[3]
- Actual frequency may be higher than what is reported in the literature.



The Joint Commission

National Patient Safety Goals Effective January 1, 2015

Hospital Accreditation Program

Goal 1
Improve the accuracy of patient identification.

NPSG.01.01.01
Use at least two patient identifiers when providing care, treatment, and services.

--Rationale for NPSG.01.01.01--
Wrong-patient errors occur in virtually all stages of diagnosis and treatment. The intent for this goal is two-fold: first, to reliably identify the individual as the person for whom the service or treatment is intended; second, to match the service or treatment to that individual. Acceptable identifiers may be the individual's name, an assigned identification number, telephone number, or other person-specific identifier.

Introduction (cont.)

- Patient and procedure verification errors occur not only during surgery but also during non-surgical procedures such as in Radiology.
- Failure to correctly identify patients may lead to wrong-patient, wrong-site, wrong-side, and wrong-procedure events.

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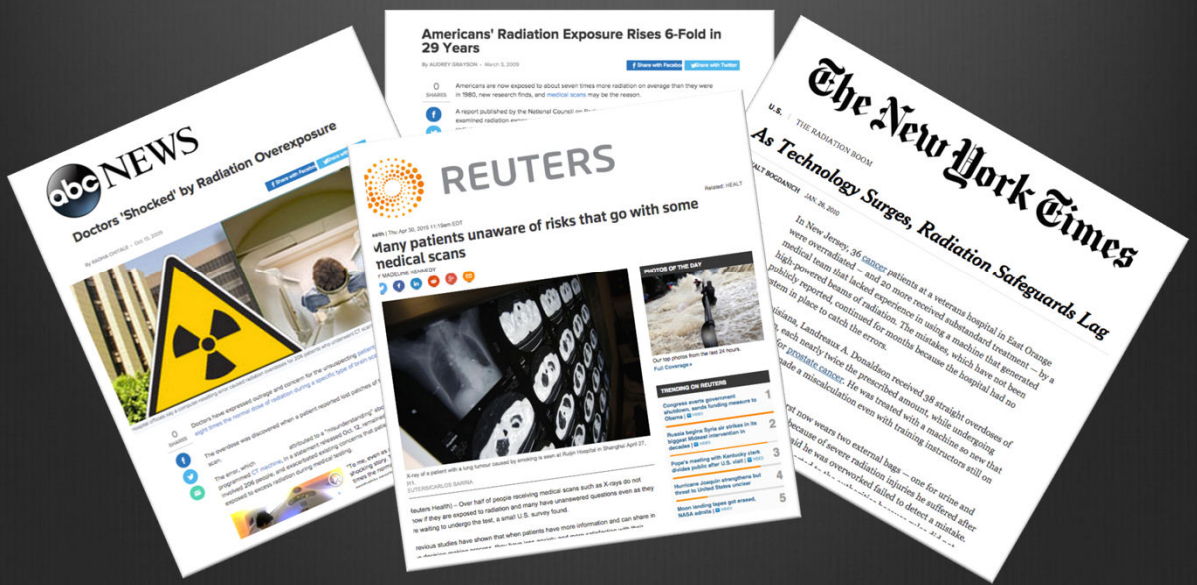

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Common causes of errors at imaging

1. **Incorrect order or requisition:**
   - Site and laterality
   - Study
   - Contrast or pharmaceuticals

1. **Scheduling errors:**
   - Failure to verify orders before or after scheduling
   - Patient misidentified during scheduling

2. **Communication errors:**
   - Pertinent history (e.g., allergies)
   - Orders cancelled or changed
   - Medical / surgical plan not conveyed

4. **Failure to verify patient identity at imaging:**
   - Similar patient names
   - Patient misunderstands name
   - Patient not involved in identification process
   - Failure to use two patient identifiers

5. **Failure to verify site and procedure at time of imaging:**
   - Site and laterality
   - Study
   - Contrast or pharmaceuticals

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Events timeline

April 2013 through June 2014

We experienced an unusual cluster of 4 wrong-site imaging errors

June

Multidisciplinary team from Radiology, Nursing, Patient Safety and clerical staff conferred to evaluate errors

June

Detailed Root cause analysis (RCA) & Failure Mode Analysis (FMEA) performed

Adapted Universal Protocol standards to our imaging protocols

August

Two *additional* wrong-site errors occurred during a two-week period

Plan-Do-Study-Act (PDSA) methodology determined errors were due to significant delays at imaging

August

Added repeat time-out verification following significant delays AND site marking using an adhesive label

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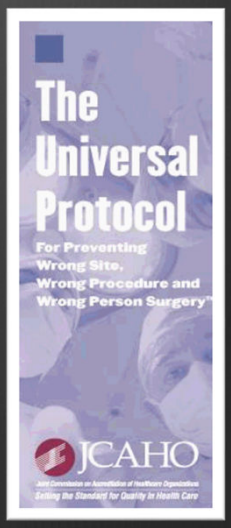
Time-out verification

- Adopted best practices from Interventional Radiology and Surgery, including Universal Protocol (UP) two-person "time-out" verification[4]:
  - Two patient identifiers
  - Verify site and laterality
  - Ensure proper patient identification is entered into imaging equipment
  - Verify patient positioning
  - Site marking with a sticker or adhesive tape
  - Require additional personnel be present during the verification process



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Generations +Northern Manhattan Network
Lincoln Medical and Mental Health Center
Radiology Exam Verification and Time Out

Patient Name: _____ Medical Record #: _____ DOB: _____

Date: _____ Accession #: _____

I. Procedure/Site

Procedure Name/Sites: _____

Side/Laterality: _____

				Tech's Initial	Witness's Initial
Contrast Order	☐ Yes	☐ No	☐ N/A		
Verified contrast expiration date.....	☐ Yes		☐ N/A		

II. "Time Out" - Final Verification:

Time:_____

			Tech's Initial	Witness's Initial
1) "Time Out" takes place at the procedure location.....	☐ Yes			
2) Patient has been identified using 2 identifiers.....	☐ Yes			
3) Patient Safety Flow Sheet is accurate and completed (If IV contrast used)....	☐ Yes	☐ N/A		
4) Team concurs on the				
A. Correct Procedure to be performed.....	☐ Yes			
B. Correct Site.....	☐ Yes			
C. Correct Laterality.....	☐ Yes	☐ N/A		
D. Correct Site/Laterality marked.....	☐ Yes			
5) Pregnancy: For female patients between 11-55yrs., ask if patient is pregnant	☐ Yes	☐ N/A		

Pregnancy Status: ☐ Yes (Get informed consent) ☐ No (Proceed with exam) ☐ Not Sure (Consult with referring physician)

Signature/Acknowledge completion of all of the steps above

Technologist: Name Print: _____ Sign: _____ Title: _____ Time: _____

Witness: Name Print: _____ Sign: _____ Title: _____ Time: _____

IV. After Scan:

After scan, ensure the following are done, if applicable

Document contrast given..... ☐ Yes ☐ N/A

Sent to VRC..... ☐ Yes ☐ N/A

Tech Initials: _____

Patient Name: _____ Medical Record #: _____ DOB: _____

Date: _____ Accession #: _____

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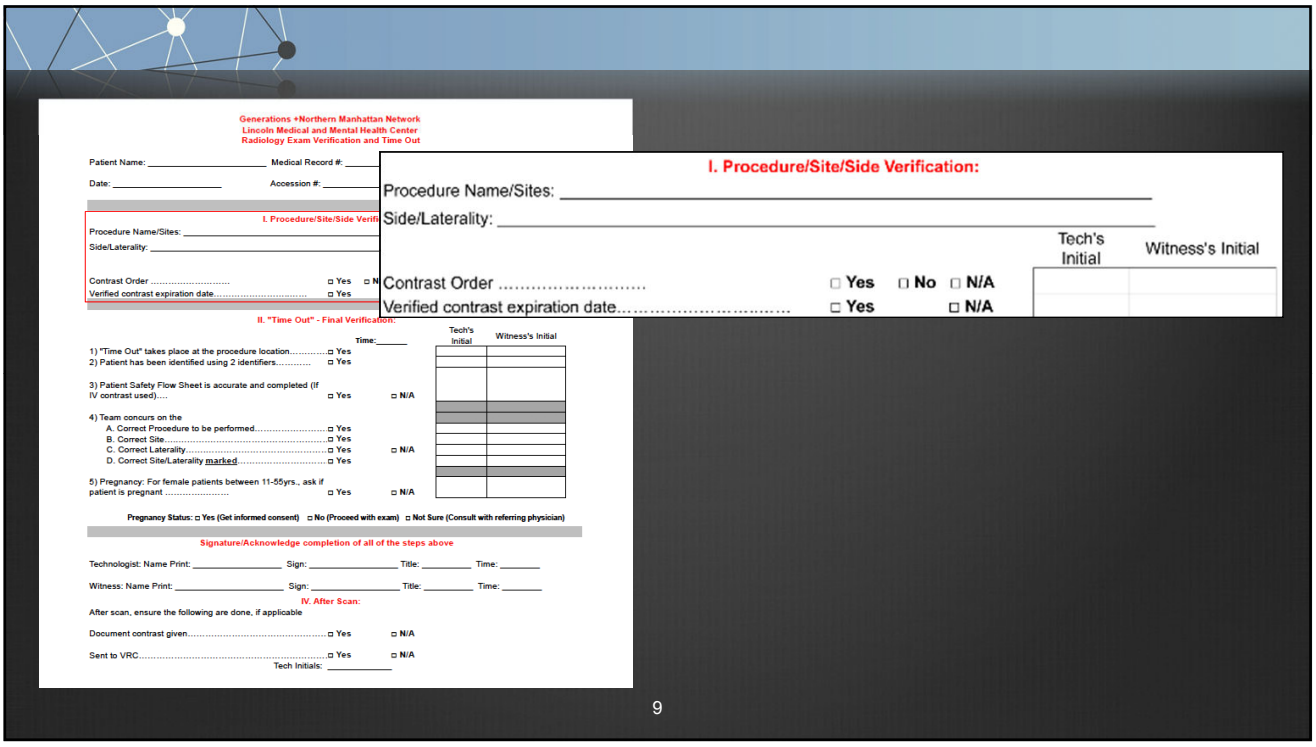
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Lincoln Medical and Mental Health Center
Radiology Exam Verification and Time Out
Patient Name: _____ Medical Record #: _____
Date: _____ Accession #: _____
I. Procedure/Site/Side Verification:
Procedure Name/Sites: _____
Side/Laterality: _____
Contrast Order ..... ☐ Yes ☐ No ☐ N/A
Verified contrast expiration date..... ☐ Yes ☐ N/A
Tech's Initial
Witness's Initial
II. "Time Out" - Final Verification:
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Sent to VRC..... ☐ Yes ☐ N/A
Tech Initials: _____

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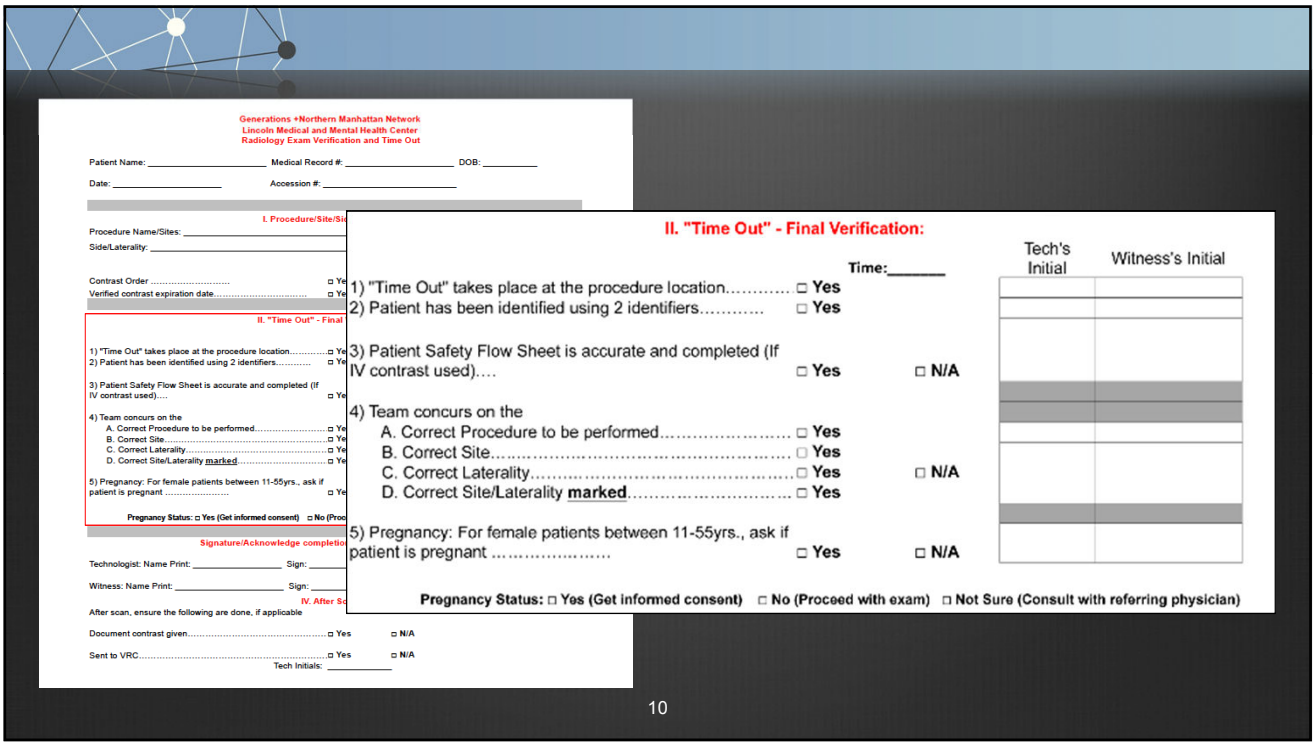
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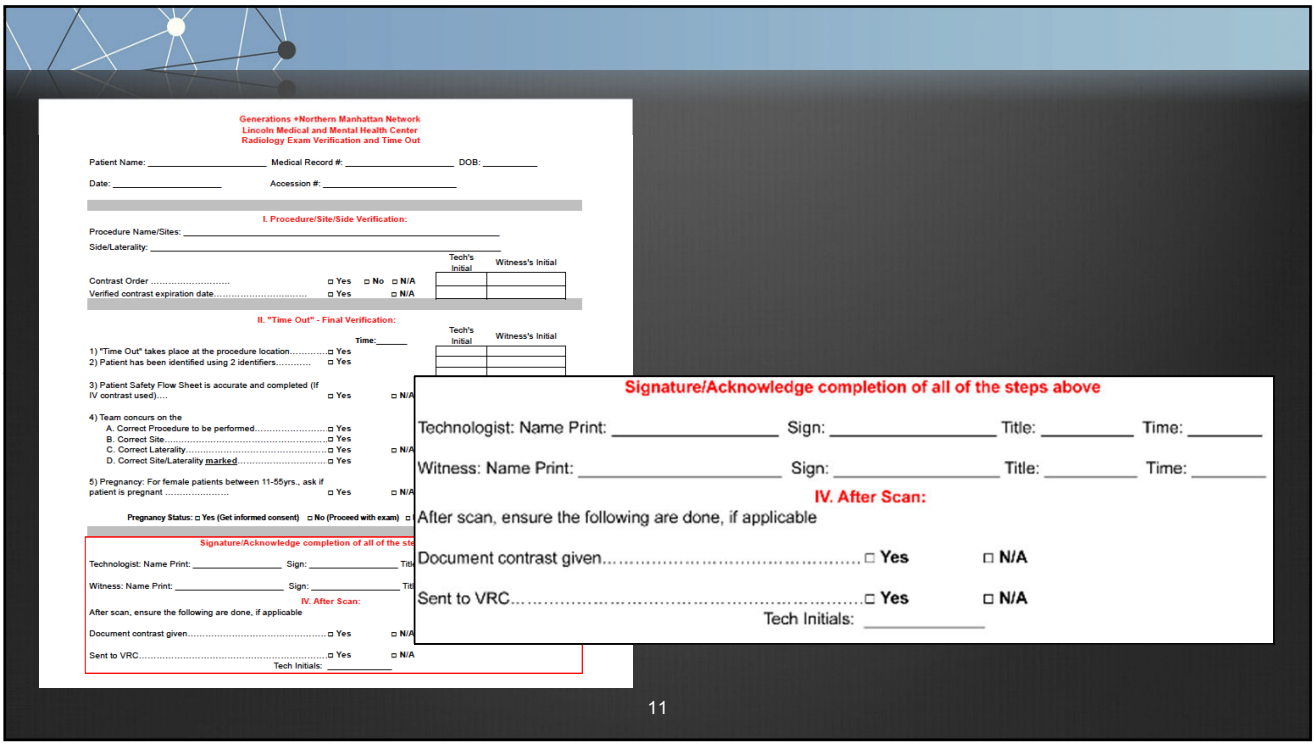

Generations +Northern Manhattan Network
Lincoln Medical and Mental Health Center
Radiology Exam Verification and Time Out

Patient Name: _____ Medical Record #: _____ DOB: _____

Date: _____ Accession #: _____

I. Procedure/Site/Side Verification:

Procedure Name/Sites: _____

Side/Laterality: _____

				Tech's Initial	Witness's Initial
Contrast Order	☐ Yes	☐ No	☐ N/A		
Verified contrast expiration date.....	☐ Yes		☐ N/A		

II. "Time Out" - Final Verification:

Time:_____

				Tech's Initial	Witness's Initial
1) "Time Out" takes place at the procedure location.....	☐ Yes				
2) Patient has been identified using 2 identifiers.....	☐ Yes				
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C. Correct Laterality.....	☐ Yes		☐ N/A		
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5) Pregnancy: For female patients between 11-55yrs., ask if patient is pregnant	☐ Yes		☐ N/A		

Pregnancy Status: ☐ Yes (Get informed consent) ☐ No (Proceed with exam) ☐

Signature/Acknowledge completion of all of the ste

Technologist: Name Print: _____ Sign: _____ Tit

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Sent to VRC..... ☐ Yes ☐ N/A

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Technologist: Name Print: _____ Sign: _____ Title: _____ Time: _____

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IV. After Scan:

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Document contrast given..... ☐ **Yes** ☐ **N/A**

Sent to VRC..... ☐ **Yes** ☐ **N/A**

Tech Initials: _____

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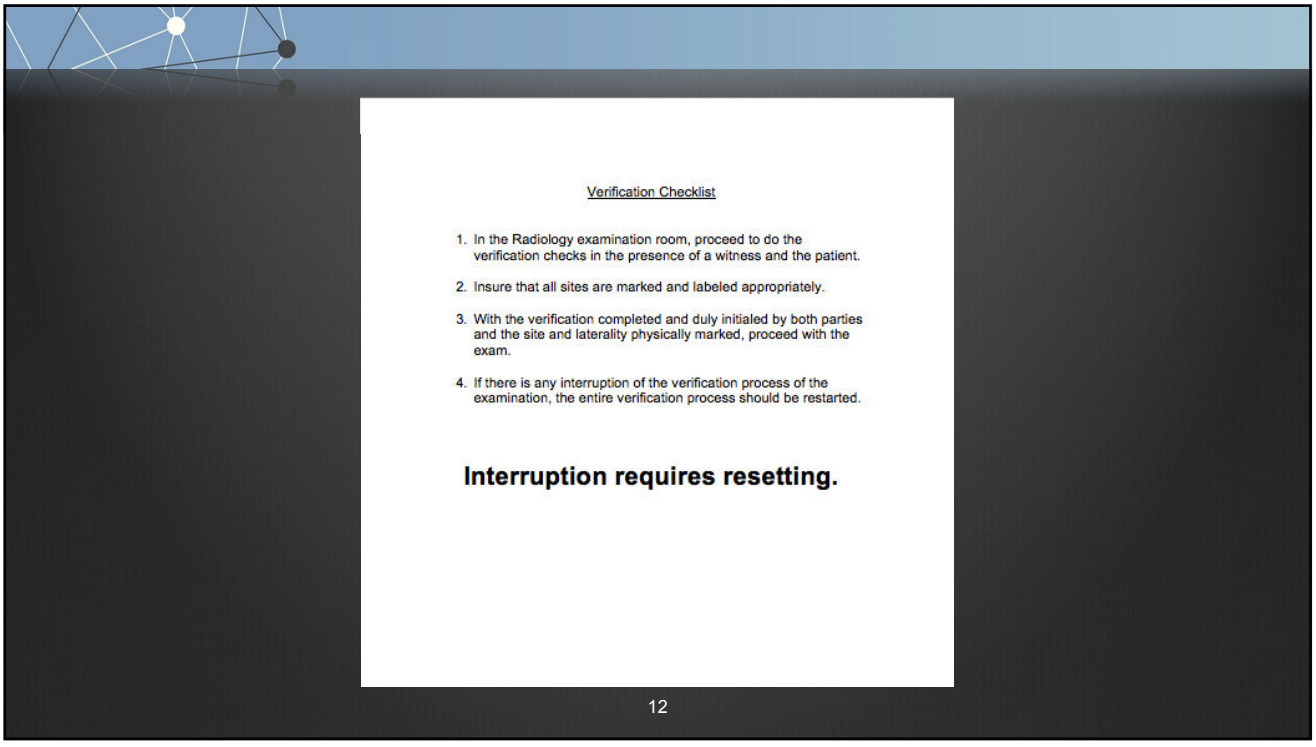

Verification Checklist

1. In the Radiology examination room, proceed to do the verification checks in the presence of a witness and the patient.
2. Insure that all sites are marked and labeled appropriately.
3. With the verification completed and duly initialed by both parties and the site and laterality physically marked, proceed with the exam.
4. If there is any interruption of the verification process of the examination, the entire verification process should be restarted.

Interruption requires resetting.

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Implementing the new process

- Technologists' ability to delete images from PACS was suspended pending review by a supervisor.
- To curtail underreporting and increase transparency, technologists were encouraged to report all good-catches and near-misses.
- Briefings during daily huddles reinforced adherence to the new protocol.

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Evaluation methodology

- We initially evaluated adherence to the new process by daily review of verification forms.
- After the first three months, adherence to time-out forms was 100%.
- We then replaced review of these forms with random direct observations of technologists:
  - 5-6 observations per shift → three shifts daily
  - Supervisor directly observes techs completing exams
- Staff that normally aids the tech in performing the verifications was also encouraged to report instances when the verification process was not performed correctly.

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Evaluation methodology (cont.)

- Also evaluated effects on patient flow by review of our wait times, from order placement to performance during ED, inpatient, and outpatient studies.
- Patient outcomes were defined as the number of wrong-patient, wrong-site, or wrong-exam events that occurred after initiation of the new verification procedure.
- Monitoring was also performed via daily reporting of near-misses and good-catches to the Patient Safety Office.

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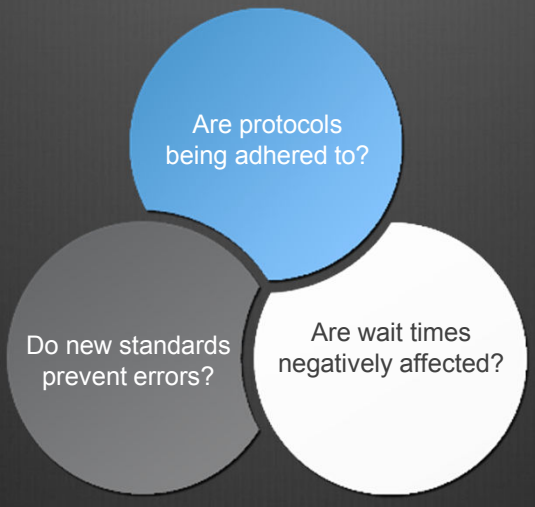
Evaluation of outcome measures



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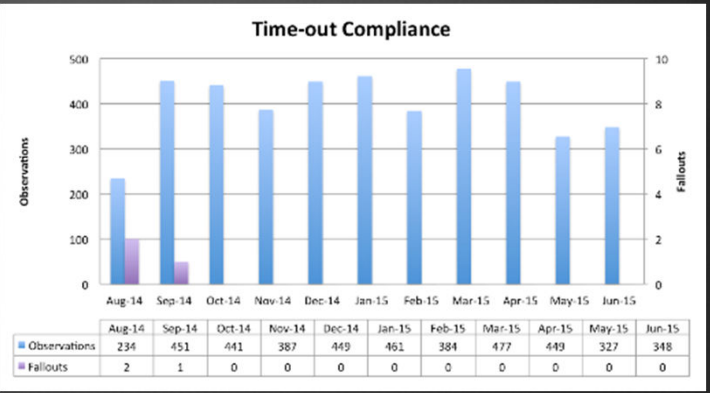
Results

- Initial evaluation of compliance of the new process with review of verification forms yielded 100% compliance within 3 months.
- Compliance as documented by random direct observations yielded 100% compliance within the first month and has since maintained that level of compliance.
- Infrequent reports of staff not following verification correctly or sequentially (Figure 1).



	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Observations	234	451	441	387	449	461	384	477	449	327	348
Fallouts	2	1	0	0	0	0	0	0	0	0	0

Figure 1

Results (cont.)

- Wait times from order to performance initially increased from 18 minutes to 27 minutes after implementation (July 2014).
- This is still below our 30-minute threshold, but nonetheless a significant increase in wait time.
- January 2015 saw increased wait times due to short-staffing.
- Wait times have since returned to 20 minutes, approximating the previous baseline (Figure 2).

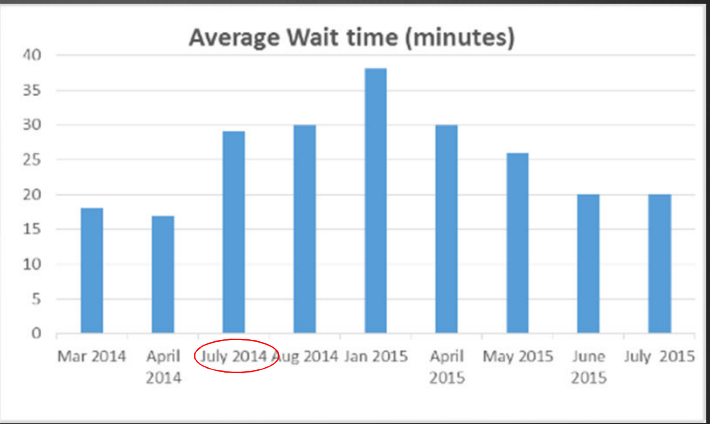


Figure 2

Results (cont.)

- Between July 2014 and October 2015, we have not experienced any wrong-patient, wrong-site, or wrong-examination events.
- This covers more than 200,000 diagnostic imaging studies to date.
- Additionally, the radiology department has reported the highest number of good catches by any single department within the hospital (Figure 3).

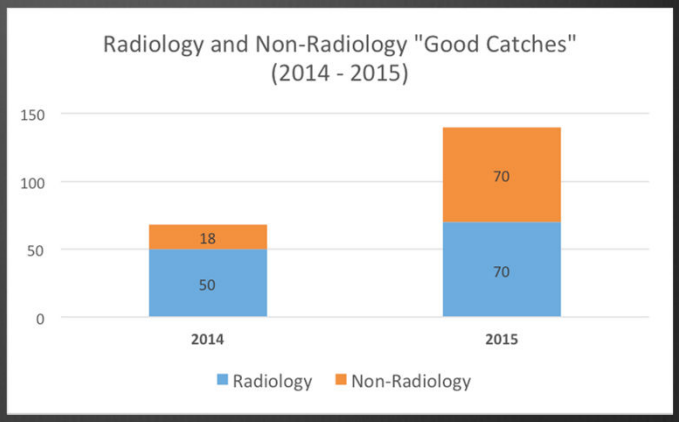


Figure 3

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Impact on Health Community and Organization

- This project focused on a proactive learning process that helped a multi-disciplinary team by working together on RCA, FMEA, and PDSA in order to achieve a very high level of excellence in eliminating errors at imaging.
- The goals of this project align with the Health and Hospital Corporation (HHC) priorities of improving patient experience and provides every patient access to error-free imaging. This improves satisfaction and therefore the ability to retain more patients presenting for radiology procedures.
- These performance improvements have been completed without any impact on resource management, financial resources, or delays in access to imaging.
- This has since been adopted as a hospital-wide performance improvement project that serves to demonstrate to all staff on how to perform two-patient identifiers and reduce errors to enhance patient safety in all other areas.

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Challenges

- A major challenge was implementation of the two-person verification process.
- Time-out requires a second technologist or nurse be called by the primary technologist, taking time away from “their own work” to verify the technologist performs the verification process correctly. This applies to medical staff within the Radiology department as well as the wards and ED.
- Stress is particularly acute when multiple exams are ordered for a single patient.
- Complacency–resulting in shortcuts–is also a constant concern.
- Patients may perceive finding additional staff for two-person verification was a “delay” in the examination.
- An additional challenge was imaging errors that occurred if there was an interruption between initial verification and performance of the procedure.

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Solutions

- What began as an extra step in the imaging process has now become part of our standard protocol.
- Instead of the technologist searching for someone to help with the 1-2 minute verification, it became apparent that it was mutually beneficial for all staff to help each other during the verification process.
- Other simple strategies have included:
  - Using examples of near-misses as educational tools to remind staff that the potential for errors always exists.
  - Using high-reliability as a topic of discussion during staff meetings as often as possible.
  - Encouraging staff to help and observe other staff members, and to give feedback whenever necessary.
  - Promote the benefits of reporting and discussing near-misses, and encourage staff to report near-misses. Awareness by staff that these errors will first be evaluated as areas for improvement in our process has improved the culture of safety in the department as evidenced by the increased reporting of “good catches” since this process began.

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Conclusion

- To date, implementation of Universal Protocol standards has markedly reduced wrong-patient, wrong-site, and wrong-examination events.
- Performance improvements were completed without a significant impact on resource management, financial resources, or delays at imaging:
  - Once staff learned to work together proactively, delays were limited.
- Our study goals align with priorities of improving patient experience and safety. Improvements in patient satisfaction subsequently increases the ability to retain more patients presenting for radiology procedures.

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Limitations / Areas of improvement

- We are yet to address the issue of incorrect orders placed by providers:
  - Good-catches data supports this is a common source for errors at imaging.
  - This has since led to a quality improvement initiative by the Department of Medicine to evaluate why physicians order incorrect imaging studies.
  - Preliminary data points to technical difficulties within the EMR as well as to interruptions in ordering.
- We are yet to address scheduling or communication errors prior to imaging.

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References

1. "National Patient Safety Goals Effective January 1, 2015." The Joint Commission. Jan 2015. (http://www.jointcommission.org/assets/1/6/2015_NPSG_HAP.pdf)
2. "Summary Data of Sentinel Events Reviewed by the Joint Commission." The Joint Commission. Dec 2012. (http://www.jointcommission.org/assets/1/18/2004_4Q_2012_SE_Stats_Summary.pdf)
3. Pennsylvania Patient Safety Advisory. "Applying the Universal Protocol to Improve Patient Safety in Radiology Services." Pa Patient Saf Advis 2011, Jun; 8(2):63-9 (http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/jun8(2)/Pages/63.aspx)
4. "WHO Surgical Safety Checklist: for radiological interventions only." National Health Service. Reference number 1121. Apr 2010. (http://www.nrls.npsa.nhs.uk/resources/?entryid45=73612)