# System to Coordinate Clinical Follow-up of Patients Presenting for Emergency Center Care after Interventional Radiology Procedures

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## PROJECT AIM

Indentify and assess 100% of patients presenting to the Emergency Center (EC) during the seven days following Interventional Radiology procedures for post-procedure complication.

## PURPOSE

A fundamental component of an Interventional Radiology(IR) Quality Assurance(QA) program is monitoring for both short and long-term complications following interventional procedures. While most patients with post-procedure complication present to the EC, there was not an efficient method to proactively indentify these patients. This adversely impacted involvement of the IR clinical staff in post-procedure care. In some cases, hospital admissions for complication treatment occurred without IR staff knowledge.

## METHODS

An automated notification agent was developed to enable the generation of email notification messages leveraging a web services-based Electronic Medical Record (EMR) architecture (Fig1). The system tracked patients who had completed IR procedures in the prior seven days. Then, the system continuously monitored the EC patient arrival census and correlated new patient arrivals against the list of recent interventional patients.

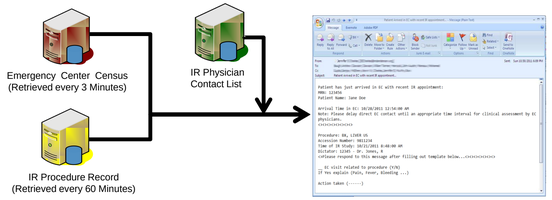


Figure 1. Automated E-mail Process

Upon identification of a patient of interest, the system would initiate an email message sent to IR fellows, the staff member of record for the interventional examination as well as administrative staff for entry into a tracking spreadsheet (Fig. 3). The IR staff member would then contact or visit the EC to determine whether the patient's EC presentation was in any way related to the interventional procedure of record and coordinate immediate intervention if this was deemed clinically necessary.

## RESULTS

- Between 12/1/2010 and 10/31/2011, system recorded 280 instances of patients presenting to EC following IR procedures (Fig. 2).
- System validated to initiate clinical notification e-mail within five minutes of patient arrival.
- Interventional radiology clinicians are advised to delay contact for several minutes to allow EC physicians to assess the patient.
- Notification system remains continues to actively monitoring patient activity and ensure active participation of interventional radiologists in post-procedure care.

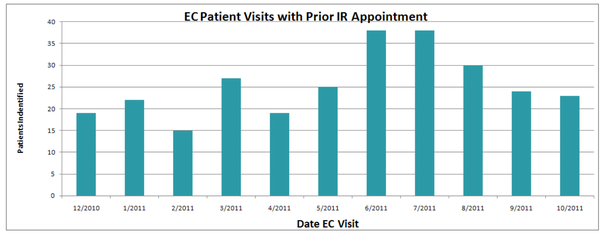


Figure 2. Notification Messages Generated

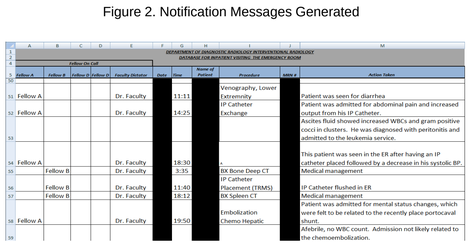


Figure 3. Notification Results Tracking Spreadsheet

## GENERALIZATION OF PROCESS

Although this system was automated utilizing the institution's EMR infrastructure, components of the system could be efficiently implemented in most institutions. Requirements include daily report of EC census and RIS-based procedure information. A daily manual review of EC patients for possible complications could provide the basis for developing further automation in subsequent iterations.

### Entry-Level System Requirements:

- Radiology Information System (RIS) provides list of patients with IR procedures in past seven days.
- EC Census *or alternative* poll RIS for patients imaged in the EC.
- Cross reference patient lists in spreadsheet.
- Spreadsheet to store outcome information.

## BENEFITS

- Provides an active clinical presence with EC clinical staff for active availability to assist with care of patients with recent IR procedures.
- Demonstrates commitment to continuity of care to patient's referring physicians.
- Allows identification of post-procedure complications more accurately and this data can be used for peer-review purposes and quality improvement initiatives(Fig. 4).
- Increasing the visibility of IR staff for consideration of involvement in the management of presenting patients for whom the IR staff has not has prior contact. Specific quantification of the benefit is under current investigation
- Constant monitoring of the EC Census for recent IR is automatically performed by computer system freeing personnel for other patient care tasks.
- Low cost of implementation utilizing e-mail based process.

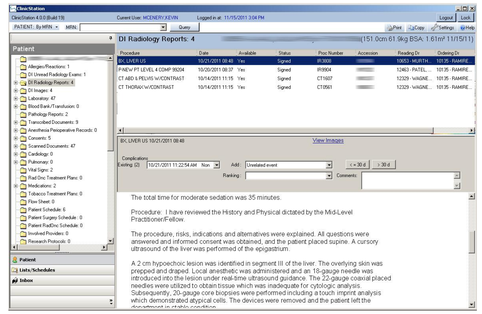


Figure 4. Complications added to patient IR QA record via entry process Integrated into institution's EMR 00000

## CONCLUSIONS

- Described notification system has proven 100% effective in notification of potential complications related to recent IR procedures and remains in daily use.
- Provides an effective means for radiologists to be pro-active in the identification of potential complications.
- Enables radiologists to proactively monitor patient activity and be an active participant in the clinical delivery process.
- **Low cost entry-level implementation could allow efficient adoption of similar QA process at other institutions**.

## ACKNOWLEDGEMENTS

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