Developing and Maintaining a Quality Improvement Initiative in a Large Community Academic Radiology Department: Highlights and Successes of a Five Year Experience

Nassau University Medical Center

S Lev MD, R Rehmani MD, N Albanese and V Scarmato MD

Purpose: The success of our recent hospital-wide JCAHO inspection was in no small part a consequence of key quality initiatives implemented in our radiology department during the past five years. Prior to implementation of these changes, monthly QA meetings were chiefly aimed at reporting unintended mishaps, such as patient falls and contrast related incidents. Our approach has since become considerably more proactive, aimed at identifying potentialities for error and implementing strategic safeguards and defenses. We reflect on our collective experience, provide insights into creating a culture of safety and shared accountability, and emphasize effective verbal and written communication, helping us to improve our quality of care.

Methods: The multidisciplinary QA team for the Department of Radiology, which provides for a 530-bed community teaching hospital, includes select representatives from over one hundred employees, including nurses, physicists, technologists, radiologists, administrators, and clerical staff.

Quality improvement and safety are the key components of the program.

- ✓ Establishment of an **online QA database** has been instrumental in providing a resource to analyze trends, educate and teach, and identify and solve problems.
- ✓ We created a radiology **resident QA "rotation"** whereby residents can learn methodologies and develop projects.
- ✓ We also employ **supervised training, guidelines and a standardized departmental policy and procedure manual** on the hospital informatics system.

Results: The **online QA database** consists of four components: Technical, Interventional, Misses/Call Backs and Critical Case Logs. Monthly educational conferences highlight Call Back entries. Interventional QA encompasses documentation of universal protocol and hand off communications ("ticket to ride"), with drill-downs into specific adverse events. Technical QA includes analysis of studies which are mislabeled, improperly positioned, poorly exposed, or artifact-laden. Current QI investigations include improving pediatric gonadal shielding and collimation compliance, reduction of fluoroscopy "on-time", and limiting CT radiation dose while maintaining image quality.

Shared Radiology Folders

- Critical Values
- Missed Cases / Call-backs
- Technical
- Interventional

Interventional QA

- Two patient Identifiers
  - Universal Protocol
  - Ticket to Ride (hand-off communication)
- No Pre-labeling
- Laterality Time Out

The Critical Case Log emphasizes timely reporting and communication of critical test results, an important national patient safety goal mandated by JCAHO. We have defined fourteen critical values which require direct clinician notification, and we routinely achieve diagnosis-to-notification times of under five minutes with "read-back" verification in over 95% of cases

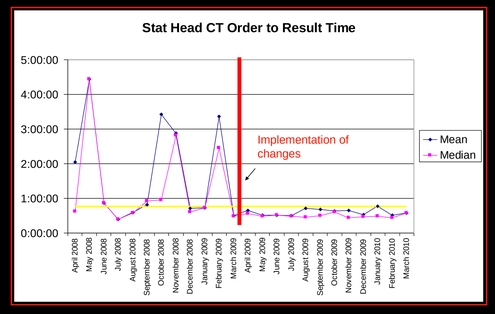
Date	Accession	Patient Name	Study Time	Time of Diagnosis	Call Time	Study Time to Call Time (Critical Test Time)	Time of Diagnosis to Call Time (Critical Value Time)	MD/DO Contacted	Read Back (Y/N)	PE	DVT	Stroke	Stroke Team	Head Bleed	Vascular injury	Visceral injury	PTX	PTX ICU (MS/C/PIB/N)	Free air	New Mass/? Tumor	Ectopic Preg	Cord Compression	Unstable Spine Fx
			11:14	11:30	11:35	0:21	0:05		Y				X										
			11:21	14:26	14:37	3:16	0:11		Y	X													
			12:15	14:05	14:20	2:05	0:15		Y	X													

The QA rotation incorporates two residents into the RQMT (Radiology Quality Management Team) per quarter, and they have the opportunity to develop QA/PI projects, to which "physician champions" are assigned.

The Process: Developing a Project

- Appoint "physician champions"
- Collect and organize data
- Identify opportunities to improve care
- Take action to improve care
- Access effectiveness of action

Especially noteworthy projects have included an analysis of those cases we have stratified as STATS and a study reviewing our experience as a designated Stroke Center (emphasizing the paramount importance of CT door to imaging time in patient triage). Instrumental to both investigations was determining causes of delays, implementing changes (i.e. redeployment of personnel and assignment of "STAT" beepers) and assessing improvements. Effective interdepartmental communication is an integral commonality to the success of both endeavors.



Time Saving Measures

- STAT beepers for techs
- Residents notified upon study completion
- Redeployed transport/ technicians

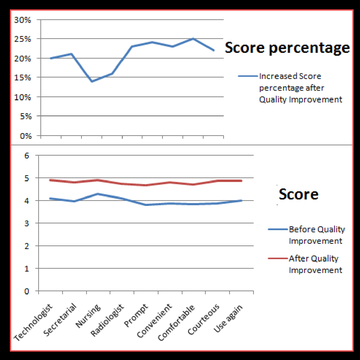
Patient safety and satisfaction is a priority and we encourage patient feedback on our performance. One study concerned the impact of QI on patient satisfaction, using a customer survey questionnaire to measure nine key factors of satisfaction, before and after departmental changes. Important measures included establishment of Performance Improvement Teams in each area, enhancing the outpatient registration experience (point of service), improving wait times to appointments and installing renovations in the physical environment. The satisfaction score ranges subsequently increased from between 14% to 25 %.

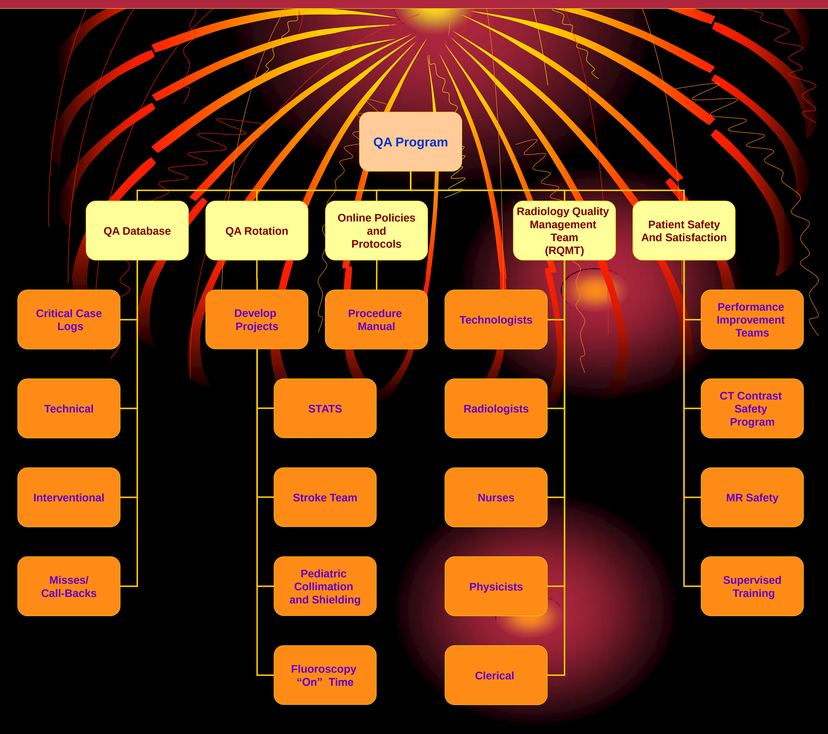
Patient Satisfaction

- Technologist
- Secretarial
- Radiologist
- Nursing
- Service promptness
- Registration convenience
- Waiting area comfort
- Staff courteousness
- Revisit intention

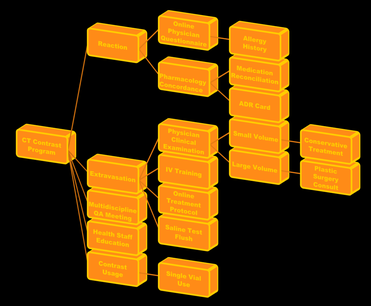
A survey questionnaire was developed to measure nine factors identified in the literature review as being key aspects of patient satisfaction. All satisfaction factors were measured on a five-point scale from 5 very satisfied or very good to 1 very dissatisfied or very poor.

	Mean Satisfaction Score (1-5)	Mean Satisfaction Score (1-5)	Increased score Percentage after quality improvement
	Before Quality Improvement	*After Quality Improvement*	
Technologist	4.1	4.89	20%
Secretarial	3.98	4.82	21%
Nursing	4.3	4.9	14%
Radiologist	4.1	4.76	16%
Prompt	3.8	4.7	23%
Convenient	3.87	4.8	24%
Comfortable	3.85	4.74	23%
Courteous	3.88	4.87	25%
Use again	4	4.88	22%





Our CT contrast program is another integral component of the patient safety initiative. Documentation and analysis of trends in extravasations and allergic reactions have led us to implement supervised injection training and implementation of online contrast protocols and monitoring. Administration of saline test flushes has significantly reduced our incidence of unwanted extravasations. We have worked closely with Pharmacology to develop ADR (adverse drug reaction) cards to improve tracking and to help differentiate genuine contrast reactions from other incidents. MR safety is facilitated by instructing clinicians to fill out online prescreening forms for MR contraindications. In-service training includes CPR, IV Certification, Infection Control, Body Mechanics and Age-Specific Competency, provided by a specially trained nurse.



Conclusion: As our QA program continues to embrace the principles of CQI and TQM, we stress the importance of encouraging all staff, from front desk to radiology reading room, to see errors as opportunities for improvement and to ultimately focus on the customer: the patient. Collecting, organizing and analyzing data in a shared radiology database can help understand root causes of unwarranted events, leading to procedural and policy shifts aimed at preventing recurring episodes.