



STAT – How To Make Every Minute Count

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Purpose

To review our experience in the performance and communication of studies ordered STAT, emphasizing how data collection and analysis prompted departmental and hospital-wide system changes that significantly improved result times.

Methods

The designation “STAT” arose from a collective need to prioritize imaging studies according to urgency. A STAT is to be performed and reported directly to the ordering physician within 45 minutes, regardless of result. In an effort to reduce clinician over-ordering of inappropriate STAT studies, we narrowed the indications to three specific scenarios: head CT for new stroke, chest x-ray for code/impending code and abdominal x-ray to rule out perforation or neonatal bowel obstruction.

•Chest X-ray for Code or Impending Code

• Head CT for Stroke Code

•Abdominal X-ray one view to r/o perforation or neonate obstruction

April 2009 marked the beginning of a transformative period in regards to our STAT initiative, from both the clinical and radiological perspective. Our comparative analysis encompasses the twelve months prior to and following this time.

The Issues : Delays occurred at the transport, technician and resident end

Transport
Transporters cannot be everywhere at once.

Technician
Techs may be in OR, units, insufficient coverage

Resident
May be in procedure, unaware STAT completed

Patient information collected included study type, demographics, and hospital location. STAT turn around time was defined as the time interval between order placement and study result (as recorded in PACS system), and was further subdivided into order to study (the technologist component) and study to result (the radiologist component).

An overall analysis of all STAT studies was performed, and we further stratified our results by study type. This allowed for more detailed inspection and tailored recommendations. STAT abdominal x-rays were excluded from our analysis secondary to a small sample size (n= 3). Patients for which both STAT chest and head CTs were ordered simultaneously for the same patient, usually as part of a Stroke Team panel, were studied to determine if this produced additional unwarranted delays.

Results

Delays in reporting of STAT results were usually multifactorial, with culpabilities resting upon transporter, technician and radiologist. Transporters cannot be everywhere at once. Technicians may be preoccupied in the OR or units, or there may simply be insufficient coverage. On-call radiologists may be involved in a procedure, or may not be aware that a STAT study had recently been completed.

Multidisciplinary radiology QA meetings, with drill-downs into outliers, helped us to identify potential points of inefficiency and devise a variety of time-saving measures.

Important policy changes for the technicians included carrying STAT beepers and immediately informing the radiologist responsible for the report when a study had been completed. At the radiologist end, we implemented a revised color coded worklist which highlighted STAT studies.

Chest x-ray delays were significantly reduced by bypassing clerical staff, diverting the notification slips for STAT orders directly to the technologist lounge. The technologist is instructed to document in the Radiology Information System any mitigating circumstances that may have produced additional delays, such as the patient undergoing a simultaneous emergency procedure in the unit.

Time Saving Measures

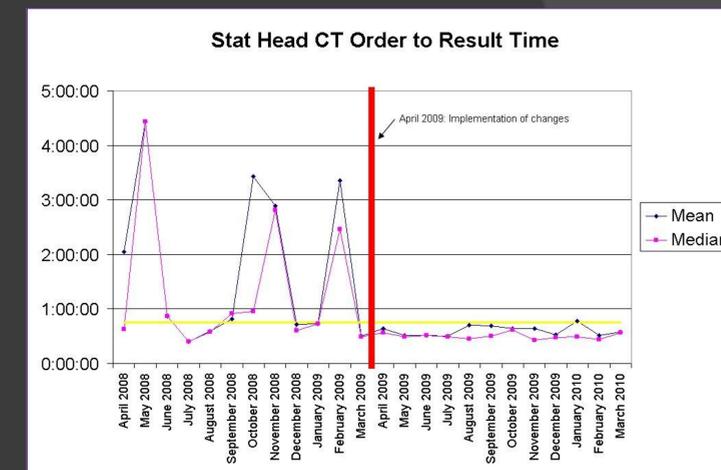
- ✓ STAT beepers for techs with immediate resident notification
- ✓ Revised color coded work lists for STATS
- ✓ Chest X-ray runner slips print directly to tech work area
- ✓ Redeployment of transport and technician team
- ✓ Monitoring of STAT times and performance drill downs to assess trend

The average median monthly chest STAT turn-around time (after April, 2009) improved from 51 min 20 sec to 43 min 16 sec, with results approaching statistical significance (p=0.08).

Major policy restructuring regarding STAT head CTs included formation of a multidisciplinary Acute Stroke Team, implementation of a special hospital-wide education campaign (emphasizing the importance of timely stroke diagnosis and management) and development of a streamlined computerized Stroke Panel Order Set (including STAT CT scan orders, a Stroke Panel, the NIH Stroke Scale and more).

The CT technologist and the covering radiologist receive stroke page alerts, facilitating timely action. The CT table will be cleared immediately for the emergency and the radiologist will know to await the study.

The average monthly median order to result time for head CTs dropped impressively from 1 h 19 min 25 sec prior to these procedural changes to 30 min 6 sec. This reduction was statistically significant (p < 0.025). Furthermore, variability in data results markedly decreased and the median values for all months after performance improving measures were less than 36 min.



Medians	2008 Chest	2009 Chest	2008 Head	2009 Head
January	0:47:14	0:24:48	0:20:11	0:43:43
February	1:02:13	0:40:53	0:34:39	2:27:36
March	0:42:20	0:38:06	0:33:55	0:29:25
April	1:09:55	0:54:23	0:37:25	0:33:42
May	1:16:28	0:37:51	4:26:09	0:29:02
June	0:42:11	0:53:01	0:52:04	0:30:47
July	1:13:24	0:33:17	0:23:48	0:29:22
August	0:40:23	0:37:58	0:34:48	0:26:54
September	0:43:13	1:06:50	0:55:24	0:30:13
October	1:02:36	0:53:24	0:57:00	0:36:33
November	0:52:01	0:33:16	2:49:12	0:25:57
December	0:52:00	0:40:05	0:36:32	0:28:31

Conclusions

Teamwork and communication between clinical staff and radiology is imperative in achieving timely management of emergency cases. We highlight several potential policy changes, which can significantly improve STAT Turn-Around Times, emphasizing the importance of database analysis in identifying problem areas and formulating time saving measures.

When it comes to averting the often devastating neurologic sequelae of stroke, every minute counts, and the Stroke Team guidelines we have implemented have made a noticeable difference. We continually strive to improve performance measures concerning the timeliness of our reporting through monthly QA meetings. Our goal is to exemplify how a large community hospital can not only meet the guidelines, but can exceed them.

Why are these Measures so Important to Follow?

Time is brain.

Every minute counts in successfully averting permanent neurologic sequelae of stroke. Equally important are prompt xray interpretations for codes and neonatal or adult obstruction or perforation