Appropriateness Criteria for Ordering STAT Studies

Yosef Glick[1], Jiabao Xie[1],Mark Bramwit [1,2]

1.Rutgers Robert Wood Johnson Medical School & RWJ Barnabas-RWJUH, New Brunswick, NJ 08901, USA

2.University Radiology Group, East Brunswick, NJ, 08816, USA

Purpose

Over the past decade, the volume of radiology examinations has nearly doubled, continuing a trend observed since the mid-1990s. Despite the increasing demand for diagnostic imaging, the number of practicing radiologists has not grown at a comparable pace. This imbalance has led to rising workloads, increased risk of burnout among radiologists, greater healthcare expenditure, and heightened patient exposure to ionizing radiation. In the inpatient setting, radiology studies are generally classified as either STAT or routine. STAT imaging is intended for emergent situations where rapid interpretation may be life-saving and immediate medical intervention is required. In contrast, routine imaging encompasses non-urgent studies, typically performed to monitor chronic conditions, assess disease progression, or investigate non-critical symptoms. These studies are interpreted in chronological order after all STAT exams have been completed. A significant concern has arisen with the increasing misuse and overutilization of STAT orders for cases that do not meet the urgency criteria. This practice adversely impacts the quality and timeliness of care by delaying interpretation of truly emergent cases and prolonging wait times for routine studies. Furthermore, it contributes to inefficient resource allocation and increased stress within radiology departments. To address these challenges and promote equitable and efficient patient care, it is imperative to implement a standardized policy that clearly defines the criteria for ordering STAT imaging studies.

This proposal recommends that STAT imaging be strictly reserved for scenarios where the results will directly influence immediate clinical management. Examples include, but are not limited to, a head CT for suspected stroke or trauma, a chest x-ray to confirm endotracheal tube placement or evaluate acute respiratory distress, or abdominal imaging in the context of a suspected surgical emergency. Routine imaging should be designated for non-emergent needs such as follow-up assessments or evaluation of stable, chronic complaints. To support this differentiation, all imaging orders must include a clear clinical indication, and providers will be prompted within the electronic ordering system to confirm whether the study meets STAT criteria.To ensure adherence to this policy, providers will undergo regular education and training on appropriate ordering practices. Quarterly audits will be conducted to monitor compliance, and patterns of misuse may result in review by department leadership. Non-compliant orders may be downgraded following review by a radiologist or clinical supervisor. Additionally, this policy will be reviewed biannually to account for evolving clinical standards, incorporate provider feedback, and refine criteria as necessary.By clearly defining and standardizing STAT ordering practices, this policy aims to safeguard the quality of patient care, enhance workflow efficiency, and ensure that radiological resources are allocated appropriately to the patients who need them most urgently.

Methods

A total of 128 inpatient STAT CT studies were retrospectively selected over a two-week period from Robert Wood Johnson University Hospital. Head CTs ordered for code stroke were excluded due to their unique prioritization and clinical urgency. For each study, the indication, pertinent findings, and any resultant interventions were reviewed through the patient's chart. Pertinent positive findings were defined as those directly correlated with the study indication and requiring medical attention—for example, pneumoperitoneum, small bowel obstruction, or metastatic disease. Urgent interventions were defined as procedures performed within 24 hours that could not have been delayed. These included surgery, embolization, tissue plasminogen activator (TPA) administration, nasogastric tube decompression, and drainage.Routine procedures, specialist consultations, and medical management were categorized as non-emergent, as these were not significantly influenced by the immediate availability of imaging results and did not alter the patient's clinical course in the acute setting.

Charts and Graphs

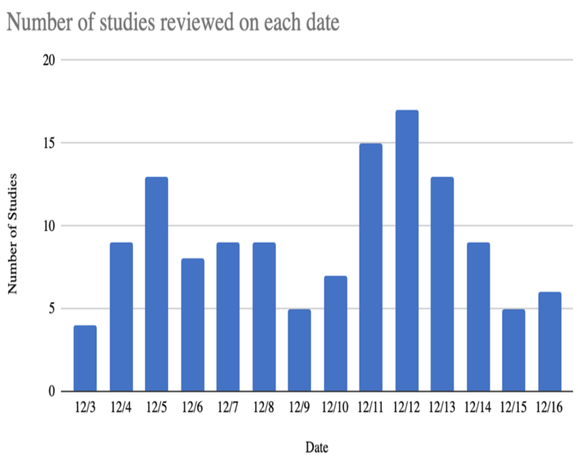


Chart 1: Number of studies reviewed on each date from 12/3/2024 - 12/16/2024. The lowest number of studies reviewed during these two weeks was 4, and the highest number was 17.

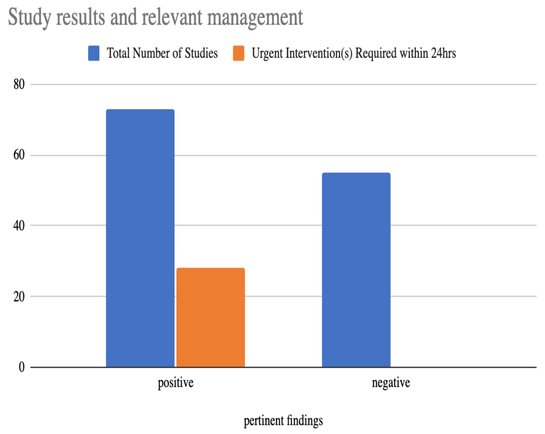


Chart 2: Study results and relevant management. Noted there were 73 out of 128 studies reported with positive pertinent finding and the other 55 studies were negative. Urgent interventions were performed on 28 patients following positive studies .

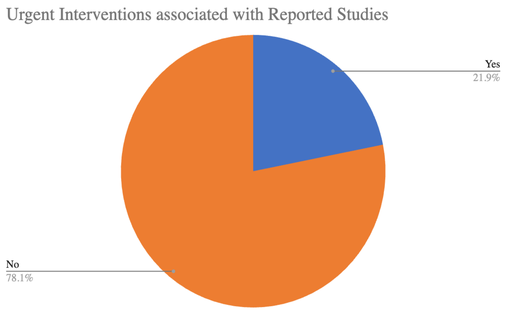


Chart 3: Urgent interventions associated with reported studies. 21.9% of the total studies contributed to urgent interventions performed within 24 hours following the reported time of the study. The rest 78.1% of the studies did not significantly change those patients' treatment plan.

Results

Among the 128 studies reviewed, the majority were CT Abdomen/Pelvis scans (122), with smaller numbers of CT cystograms (3), CT head perfusions (2), and one CTA Chest/Abdomen/Pelvis for TAVR planning. The number of studies performed per day ranged from 4 to 17 (Chart 1). Of these, 73 studies (57%) demonstrated positive pertinent findings relevant to the clinical indications. However, only 28 of those led to urgent interventions that had to be performed within 24 hours (Chart 2). Overall, 21.9% of all stat imaging studies ordered resulted in urgent, non-deferrable interventions (Chart 3).

Conclusion

This study demonstrated that STAT inpatient studies were frequently over-ordered, with only 21.9% resulting in an emergent intervention within 24 hours. This suggests that many of these studies could have been ordered as routine rather than STAT, as they did not require immediate attention. The overuse of STAT orders not only delays the interpretation and care of truly emergent cases but also pushes routine studies further back, disrupting workflow and potentially impacting patient care. To address this issue, we propose establishing clear appropriateness criteria for ordering STAT studies, helping ensure that resources are allocated effectively and that high-quality care is maintained. One approach is to implement checkpoints within the electronic medical record (EMR) at the time of ordering, prompting the provider to consider key questions such as: Do you suspect a life-threatening finding? Is an urgent intervention likely needed within 24 hours? Will a delay of more than one hour in reading the study significantly alter patient management? These prompts would help differentiate truly urgent studies from those that can safely wait, thereby reducing unnecessary STAT orders. This is particularly important during night shifts when radiology staffing is limited and emergency department volumes are high, further straining resources. For inpatients, STAT studies should be reserved for situations involving acute clinical deterioration that may necessitate urgent intervention. In most other cases, providers can rely on available clinical information and laboratory results to initiate treatment while awaiting routine imaging. Implementing these measures can help streamline radiology workflows, prevent delays for high-acuity patients, and improve overall care delivery.

References

Winder M, Owczarek AJ, Chudek J, Pilch-Kowalczyk J, Baron J. Are We Overdoing It? Changes in Diagnostic Imaging Workload during the Years 2010-2020 including the Impact of the SARS-CoV-2 Pandemic. Healthcare (Basel). 2021 Nov 16;9(11):1557. doi: 10.3390/healthcare9111557. PMID: 34828603; PMCID: PMC8621920.