Turnaround Time for Neurological Magnetic Resonance in the Emergency Department

The Problem

Despite advantages in diagnosing neurologic disease, magnetic resonance (MR) is more time-consuming, and used less in the emergency department (ED) than computed tomography (CT).

Aim/Goal

We attempted to determine whether delays inherent in MR imaging contribute to delays in diagnosis and treatment in the ED setting.

The Team

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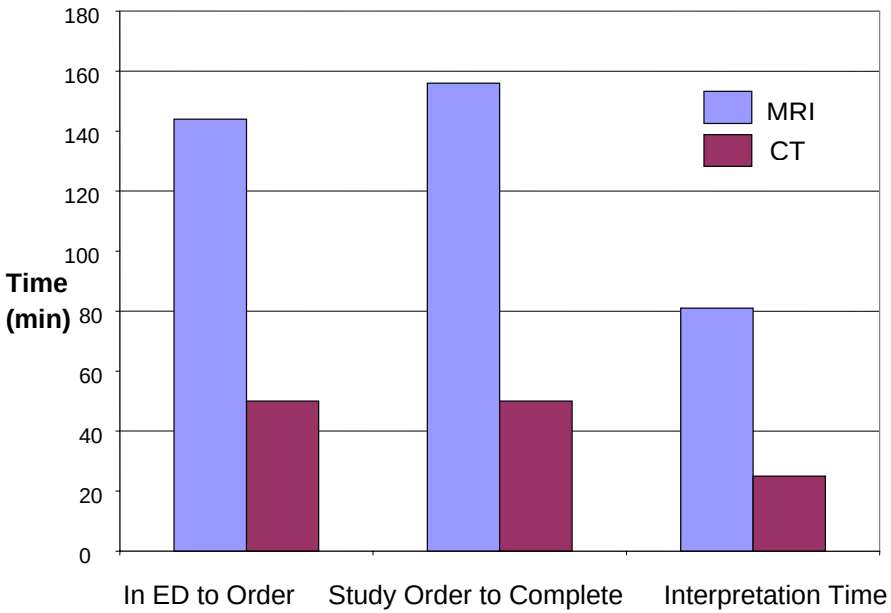
The Interventions

We analyzed all neurological MR studies – brain, neck, spine – performed on ED patients over six months: Summer – July 1st to September 30th 2009 – and Spring – February 1st to April 30th 2009 – of consecutive academic years. We performed a similar analysis of CT studies for comparison.

In the summer period we performed 127 MR and 2608 CT examinations. For MR and CT, respectively, median times were [minutes (standard deviation)] 144 (110) vs. 50 (84) from patient arrival to study order, 156 (92) vs. 50 (51) from study order to completion, and 81 (107) vs. 25 (39) from study completion to interpretation. In the spring we performed 121 MR examinations, within 1.5% of summer volume adjusted for number of days. Thus there was no “new trainee” effect on study volume.

The Results/Progress to Date



Lessons Learned

- Overall, MR imaging from the ED is far slower than CT, but this does not appear to impact negatively on clinical decision making for these patients.
  - Neither body part, shift, day of week nor resident experience level affected ordered study volume or interpretation time
- Delays for MR may be due to: more clinical workup preceding MR orders, lack of MR in the ED, requirements for patient safety checklists, limited capacity of MR, greater number of MR images to view per study, and possible resident incentive to focus first on CT studies

Next Steps/What Should Happen Next

As mean/median data were obtained, additional prospective work may be helpful to determine if the turnaround time is appropriate in individual cases and if not, how any encountered delays could have been avoided. A similar analysis of emergency MR studies on inpatients may also be useful.

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