Utilization of Inpatient MRI Studies: Do We Need Guidelines Beyond Existing American College of Radiology (ACR) Appropriateness Criteria?

The Problem
There is increasing concern about overutilization of high-cost imaging studies such as MRI during hospital admissions. Judicious and appropriate use of inpatient MRI services may affect duration of hospital stay and overall healthcare-related costs.

Aim/Goal
Our purpose was to perform a pilot study to assess: (1) the number of inappropriate or redundant inpatient MRI studies, and (2) if existing American College of Radiology (ACR) appropriateness criteria for neuroimaging may be sufficient to identify MRI studies that were inappropriately performed in the inpatient setting.

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The Interventions
We retrospectively reviewed inpatient MRI scans performed for neurological indications over 1-month period at Beth Israel Deaconess Medical center. We determined the appropriateness of neuroimaging MRI orders based on the existing ACR appropriateness criteria as well as consensus online medical record review. All inpatient studies were classified as:

1. Appropriate: ACR rating of 4 > and record review suggesting importance in immediate clinical management.
2. Inappropriate: ACR appropriateness criteria of 4 < and/or a record review suggesting that it could be performed as an outpatient study without altering immediate clinical management.
3. Redundant: If the clinical question had already been answered by another imaging modality.

The Results/Progress to Date
Of the 293 inpatient MRI studies performed, 235 (80.2%) were considered appropriate, 48 (16.4 %) inappropriate and 10 (3.4 %) redundant.

Several additional studies could have been classified as inappropriate provided:
1. There had been a prospective dialogue between the radiologist and referring physician.
2. Patient convenience was not accommodated (inpatient MRI to exclude metastasis in the absence of neurologic symptoms).
3. There existed defined appropriateness criteria for inpatient indications (total spine screening MRI for bacteremia without back pain.)

Lessons Learned
- Our results suggest that at our institution, 1 out of every 5 inpatient MRI exams performed for neuroimaging was either inappropriate or redundant.
- Inpatient MRI studies can be further decreased if there were specific criteria for determination of appropriateness of inpatient studies along with ongoing direct involvement of a radiologist.

Next Steps
- We plan to collect additional retrospective data for 6-12 months
- A second (prospective) phase of the study will consist of ongoing daily determination of appropriateness of an inpatient MRI study (after the study is performed) but while the patient is still in the hospital, including a dialogue with the referring physician about rationale for the inpatient study.
- Based on the prospective-phase II study results, we will create new appropriateness criteria.
- A third (prospective) phase of the study will be the implementation of the newly created appropriateness criteria to actually decrease the utilization of inpatient MRI services over a 6-month period.