

OVER-UTILIZATION OF ADVANCED IMAGING IN THE HOSPITAL SETTING: AN EDUCATIONAL APPROACH TO REDUCE UNNECESSARY INPATIENT STUDIES

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BACKGROUND

By several measures, health care spending continues to rise, forcing businesses and families to cut back on operations and household expenses.

In 2008, health care spending in the United States reached \$2.4 trillion dollars, and is projected to reach \$3.1 trillion in 2012.¹

During the past decades, there has been a steady increase in the utilization of expensive inpatient imaging studies, with an overall increase in health care costs.² In particular, advanced imaging includes CT, MRI and Nuclear Medicine, used for the diagnosis and management of hospitalized patients.

The reasons for unnecessary imaging examinations include indirect financial benefit to physicians, medico-legal considerations, lack of accepted guidelines or failure to follow established ones.

In the United States alone, it is estimated that CT testing accounts for around 6,000 additional cancers per year, with about half of those proving fatal.³ Each radiologic study using gadolinium presented a 2.4% risk of developing nephrogenic systemic fibrosis, with significant morbidity and mortality

PURPOSE

This study aimed to decrease the number of radiological studies ordered by medical interns through targeted education.

MATERIALS AND METHODS

In our 703 bed, tertiary care center, medical interns, under attending supervision, order the majority of tests and treatments for inpatients. The medical interns were given a lecture by a senior radiologist at the beginning

of their internship year in late June 2007. The conference, developed in conjunction with the Internal Medicine Program Director, described the risks, benefits and alternatives of the various imaging modalities. The discussion emphasized the radiation exposure of various modalities and the increasing costs related to unnecessary imaging. The goal of the lecture was to educate the interns about radiology studies and their appropriate usage. The radiologist emphasized the department's availability to the medical staff for any questions encountered during the study period.

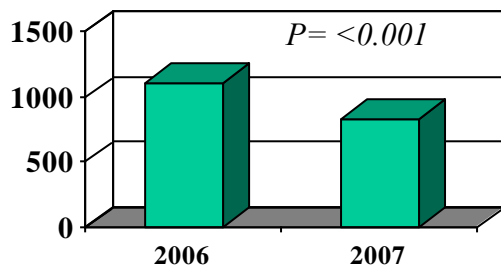
Over a six-month period, we analyzed the ordering pattern for medical interns who did not receive the lecture (July through December 2006), and compared it to those who had received the lecture, (July through December 2007).

During the period after the intervention, the interns were not influenced in any fashion regarding their patterns of imaging ordering.

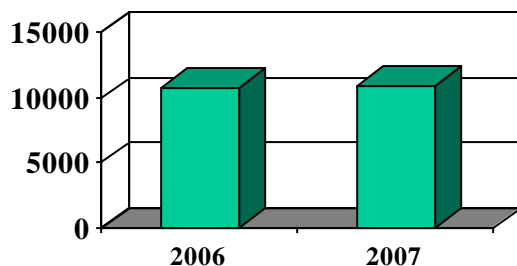
RESULTS

An overall reduction of 26% in the studies ordered per discharge was seen comparing 2007 to 2006 (p value < 0.001). There was a consistent decrease in CTs per discharge, averaging a reduction of 18% over the study period. MRI and Nuclear medicine studies performed per discharge were also reduced 38% and 22%, respectively.

Over the study period, 1101 advanced imaging studies were ordered in a 6-month period in 2006 by medical interns, compared to 827 in 2007. The number of discharges from July to December in 2006 compared to 2007 was not significantly different, 10,658 vs. 10,819, respectively.



TOTAL ADVANCED
IMAGING ORDERING
STUDIES



TOTAL NUMBER OF
ADMISSIONS

CONCLUSION

Unnecessary advanced imaging of inpatients was significantly reduced by an easily replicated and cost effective intervention of a one-hour informative lecture to the ordering physicians (medical interns).

CLINICAL RELEVANCE

We have shown that education of the ordering physicians is a feasible and cost effective means to decrease the over-utilization of advanced imaging in the inpatient setting.

References

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2. Friedman DP, et al. "Experience of an academic neuroradiology division participating in a utilization management program". *J Am Coll Radiol.* Feb 2009.
3. "Radiation dose in computed tomography: why it's a concern and what you can do about it". : *Health Devices.* 2007 Feb;36(2):41-2, 44-63