

Tales From the Field

Root Causes of Errant Ordered Radiology Exams

by Benjamin D. Duman

Tales from the Field, a monthly column, consists of reports of evidence-based performance improvement practice and advice, presented by graduate students, alumni, and faculty of Boise State University's Instructional and Performance Technology department.

Errant Ordered Radiology Exams

In the last 30 years, both healthcare practices and technology have made quantum leaps in efficiency, time savings, and volumes of procedures. However, with these and other healthcare advances, economic realities producing increased expectations for patient throughput have given way to an increase in well-publicized frightening medical errors, such as wrong-side surgery and limb removal. However, there are other types of medical errors that are not widely studied and known, but can lead to unfavorable outcomes for both hospital staff and the patients they serve. They are the errors that are knowingly and unknowingly instigated by primary caregivers when requesting radiology exams for their patients. Errant orders such as incorrect exams, wrong anatomical side (left or right) designation, wrong diagnosis codes, duplicate orders, and contrast-related errors (image enhancing injection) lead to increased patient wait time, unwarranted radiological elements (radiation), and increased costs for duplicate and unneeded exams. For example, ATA Hospital (a pseudonym used for confidentiality purposes) recently found numerous ordering errors occurred in its out-patient radiology clinic and its main campus. The author conducted his master's thesis research at ATA Hospital to investigate this performance problem.

Research Methodology

The author conducted a needs assessment to answer the following questions:

1. What causes the increase in errant radiological orders at ATA Hospital?
2. What types of solutions will reduce errant orders within ATA's radiology department, while aligning with ATA Hospital's budget and mission?

In order to answer the research questions, both qualitative and quantitative data collection methods including open-ended voluntary interviews, observations, and historical data were utilized. Sample groups from five different job classifications within ATA Hospital were identified as both key stakeholders and dependant personnel throughout the process of completing a radiology test. The five job classifications identified and designated as data collection sources were: (a) ordering physicians, (b) floor nurses (nurses not associated with the radiology department), (c) radiology schedulers (those identified as scheduling patient exams), (d) radiology nurses, and (e) radiology administration.

Research Results

Qualitative data, responses from all interviews and observations, were reviewed for patterns. They were then triangulated with historic quantitative data of documented and resolved errant radiology orders at ATA Hospital. Using Gilbert's BEM (see Table 1), the contributing factors were categorized as a lack of data, instruments, incentives, and knowledge in regards to the entire radiology order process. The first factor is a lack of data and feedback for physicians and support staff. The second factor is a lack of instruments, specifically a lack of consistency in radiology exam order sheets. The third factor is

incentives or lack thereof by not providing positive or negative consequences when exams were properly or errantly ordered, respectively. The last factor lies within knowledge, in that it is difficult for ordering physicians and radiology schedulers to keep up with changing exam protocols.

	Information	Instrumentation	Motivation
Environmental Supports	<p>1. Data</p> <p>Lack of ATA Hospital conveying feedback or information to physicians.</p> <p>Lack of agreed-upon standard.</p> <p>Lack of adequate guidance in ordering radiological tests.</p>	<p>2. Instruments</p> <p>Lack of consistency in radiology exam order sheets.</p>	<p>3. Incentives</p> <p>No negative consequences to the ordering physician because of errant orders.</p> <p>No positive reinforcement when exams are correctly ordered.</p>
Person's Repertory of Behavior	<p>4. Knowledge</p> <p>Difficulty for ordering physicians and radiology schedulers to keep up with changing exam protocols.</p>	<p>5. Capacity</p> <p>No deficiencies were detected.</p>	<p>6. Motives</p> <p>No deficiencies were detected.</p>

Table 1. Causes Featured in BEM

Conclusions/Suggestions for Implementation of Solutions

Following Gilbert's BEM and diffusion effect theory, the author proposed two short-term solutions, and a third, long-term solution that will be effective in drastically reducing the occurrences of errant ordered radiology exams.

1. The first proposed short-term intervention is a quick reference, paper-based sheet that can be utilized by ordering physicians and ATA staff as a job aid to answer questions about radiology exams.
2. The second proposed short-term intervention is a radiology order form that is standardized in format and nomenclature, regardless of hospital location.
3. The third proposed implementation is a long-term solution that will require further research and funding, but will provide a viable and effective long-term return on investment. It is a software utility that would incorporate the use of the quick reference sheets in a digital format that will allow physicians to select the proper exam based on the results of the electronic, quick reference utility. The proposed interface will show a graphic of a human subject. Based on a patient's symptoms and anatomical location, the physician will use a touch screen, starting with anatomy, and then the desired radiology modality, to select the recommended exam order. It is the rationale of the author

that a software utility such as the one described could be used not only by ordering physicians, but too by all hospital staff, and would drastically reduce the occurrences of errant ordered radiology exams.

References

Gilbert, T. F. (1978). *Human competence: Engineering worthy performance*. New York: McGraw-Hill.

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