ORIGINAL ARTICLE

In-Person Communication Between Radiologists and Acute Care Surgeons Leads to Significant Alterations in Surgical Decision Making

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Abstract

Purpose: The aim of this study was to determine if direct in-person communication between an acute care surgical team and radiologists alters surgical decision making.

Methods: Informed consent was waived for this institutional review board-exempt, HIPAA-compliant, prospective quality improvement study. From January 29, 2015 to December 10, 2015, semiweekly rounds lasting approximately 60 min were held between the on-call acute care surgery team (attending surgeon, chief resident, and residents) and one of three expert abdominal radiologists. A comprehensive imaging review was performed of recent and comparison examinations for cases selected by the surgeons in which medical and/or surgical decision making was pending. All reviewed examinations had available finalized reports known to the surgical team. RADPEER interradiologist concordance scores were assigned to all reviewed examinations. The impression and plan of the attending surgeon were recorded before and after each in-person review.

Results: One hundred patients were reviewed with 11 attending surgeons. The in-person meetings led to changes in surgeons' diagnostic impressions in 43% (43 of 100) and changes in medical and/or surgical planning in 43% (43 of 100; 20 acute changes, 23 nonacute changes, 19 changes in operative management) of cases. There were major discrepancies (RADPEER score $\geq$3) between the impression of the reviewing radiologist and the written report in 11% of cases (11 of 100).

Conclusions: Targeted in-person collaboration between radiologists and acute care surgeons is associated with substantial and frequent changes in patient management, even when the original written report contains all necessary data. The primary mechanism seems to be promotion of a shared mental model that facilitates the exchange of complex information.

Key Words: Quality improvement, multidisciplinary, collaboration, decision making, diagnostic error

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INTRODUCTION

Modern electronic medical record systems and PACS permit the instantaneous delivery of imaging and associated interpretation data across the health system, minimizing the need for direct in-person consultation to exchange information. However, sterile electronic communication methods such as dictated radiology reports can create ambiguity [1] and may fail to foster between radiologists and treating physicians a shared mental model of patients' conditions [2]. Direct in-person communication between radiologists and referring physicians may improve mutual understanding along a variety of axes, including (1) radiology test characteristics (eg, sensitivity, positive predictive value), (2) detailed medical and/or surgical history (eg, information concealed in an old history and physical examination), (3) a clearer appreciation of the clinical question (eg, details missing from the radiology requisition), and (4) a superior understanding by the referring physicians of the meaning of the dictated report (eg, complex anatomic relationships, temporal trends).

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Research on health care team effectiveness has shown that member diversity in training and experience (eg, surgeons and radiologists) underlies improvement in team effectiveness [3]. Furthermore, it has been shown that geographically collocated teams that engage in face-to-face interaction experience lower levels of conflict than teams relying solely on electronic communication [4]. This model is frequently applied in oncologic care, in which multidisciplinary tumor boards are standard in many practice environments. Several studies have identified significant rates of change in treatment planning through the use of multidisciplinary tumor boards [5-7], but to date, this model has been used primarily in nonacute settings (eg, oncology) because of the difficulty organizing urgent, impromptu multidisciplinary meetings in the acute setting (eg, acute care surgery).

Despite the difficulties of such an approach, we wanted to ascertain whether the advantages of in-person collaborative review would benefit patients on the acute care surgery service. The purpose of our study was to determine if direct in-person communication between an acute care surgical team and radiologists alters surgical decision making.

METHODS

Informed consent was waived for this institutional review board-exempt, HIPAA-compliant, prospective quality improvement study.

Multidisciplinary Review

From January 29, 2015 to December 10, 2015, 21 semiweekly multidisciplinary meetings lasting approximately 60 min each were held in the institutional abdominopelvic CT reading room. Participants at each meeting included one attending physician from the acute care surgery service, one to three attending physicians from the abdominal radiology service, one chief surgical resident, one or two abdominal radiology fellows, two to four acute care surgery residents, one or two radiology residents, one or two acute care surgery physician assistants, and one to three medical students. The acute care surgery service at the study institution is responsible for acute general surgical issues, including trauma, acute bowel pathology, burn care, and emergency department consultations.

On the morning of each meeting (6-7 AM), a list of patients (range, 3-8) managed by the acute care surgery service who were pending medical and/or surgical decision making, and who had available relevant radiologic imaging (eg, fluoroscopy, plain film, CT, MRI, ultrasound, intraprocedural imaging) for which finalized radiology reports were already created and reviewed by the surgical team, was e-mailed to the participating attending radiologist by the chief surgical resident managing the acute care surgery team. The delivered list of patients was selected by the chief surgical resident or attending surgeon and was reviewed by the attending radiologist immediately before the meeting. All directly and indirectly relevant imaging studies were identified by the multidisciplinary team; this included not only examinations performed during the current hospitalization but also potentially relevant historical examinations performed months or years before the current date across a variety of radiology specialties. When the surgical team arrived, any new patients that had been added to their roster in the interim and who were pending medical and/or surgical decision making were added to the list for review. The final list of patients was reviewed in order of clinical priority.

Before each patient was reviewed, the attending surgeon was asked to state his or her current diagnostic impression and the current treatment plan. Then, a comprehensive imaging review was performed of the primary radiologic examination pertaining to the clinical question, as well as of a variety of recent and relevant comparison examinations, while blinded to the original imaging interpretation(s). Radiologists then had the opportunity to clarify the history of the patient as well as how the surgical team intended to use information from the imaging studies to develop a management plan for the patient. Surgeons had the opportunity to directly view images, understand the precise location of imaging findings (eg, transition point[s] of bowel obstructions), and ask clarifying questions of the radiologists, such as their degree of confidence in the presence or absence of imaging findings or the general diagnostic characteristics of an examination. A key feature of this review was a comprehensive imaging assessment that spanned not just the index hospitalization but also historical radiologic examinations and clinical data that may not have been immediately or obviously relevant.

After each patient discussion, the attending radiologist reviewed the original radiology reports and revised his or her opinions if necessary. Then, the attending surgeon was asked to state his or her current diagnostic impression and current treatment plan. If this differed from the prereview diagnostic impression or plan, the details of those differences were recorded categorically and qualitatively. If there were differences between the opinion of