Strategies for Radiology Reporting and Communication. Part 1: Challenges and Heightened Expectations

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The single biggest problem in communication is the illusion it has taken place. George Bernard Shaw

Summary Sentence The goal in radiology service delivery is to improve and expand communication of report findings to the broad and diverse community of radiology consumers, requiring innovation at both the levels of the radiology report and communication schema.

Introduction

The overall effectiveness of any medical reporting instrument is tied to its ability to serve as a method for communication of data, ideas, and concepts in a clear and unambiguous fashion. In addition to these functional requirements, a number of practical and technical requirements should be considered; which involve elements of timeliness, security, confidentiality, accessibility, transmission, and verification. Regardless of how “functionally” accurate and complete the report is, its overall value in positively effecting medical care is limited if the information is not received by its intended recipients in a timely fashion, with a complete and thorough understanding of its contents. In the present form, most medical reports serve as a method of notification, in which one party (e.g., radiologist) interprets a dataset (e.g., imaging) and composes a report (e.g., radiology), in which the interpreted findings are conveyed to a recipient (e.g., referring clinician), who in turn utilizes this report information to direct patient care decision making. In this common scenario, the medial report serves a method of

one-way notification. Once it has been sent (and presumably received), the sender of the report (e.g., radiologist) assumes the recipient will correctly assimilate these report data into a timely and accurate care plan. This is often an erroneous assumption given the current state of report ambiguity and uncertainty [1, 2], not to mention the increasing workload demands and data overload facing radiologists [3]. As a result of these existing challenges and deficiencies, the report should be viewed not as an *end-all*, but instead as a first step in the communication and decision-making process.

In the “old” analog days of medical imaging practice restrictions on imaging data accessibility, workflow, and delays in report turnaround fostered a more collaborative working environment than currently exists. A referring clinician wanting timely information regarding a recently performed imaging study would literally have to travel to the radiology department, request access to the corresponding images, and then engage in a direct consultation with the interpreting radiologist. While this dynamic presented a number of workflow limitations (for all participants), it also presented a number of distinct advantages relating to direct information exchange, bidirectional understanding, and collaboration. In most cases, once the radiologist–clinician consultation had been completed, both parties had a better and more complete understanding of the clinical scenario, imaging data analysis, and follow-up requirements. This interpersonal dialogue also involved interdepartmental imaging staff (e.g., radiologists, technologists, clerical staff, and administrators) who were encouraged to routinely dialogue with one another over matters regarding imaging exam selection, scheduling, protocoling, quality assurance, clinical/imaging history, and imaging data findings, all of which indirectly or directly affected the radiology report. In addition, analog report workflow was far different, with report transcription outsourced to third party transcriptionists. This introduced

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significant time delays (and transcription errors) into report turnaround, which was measured in days as opposed to hours. While these reporting delays created frustration on the part of referring clinicians (and their staff), they did come with a positive effect, in fostering a greater degree of consultation and interpersonal communication between the parties.

With the digitization of medical imaging and the introduction of digital information system technologies such as the picture archival and communication system (PACS) and radiology information system, a number of dramatic changes occurred in practice which profoundly affected radiology reporting. On a positive note, imaging data were instantaneously and ubiquitously accessible to medical staff, both in and outside of the healthcare enterprise. This meant that a referring clinician (with the appropriate credentials) could access imaging data in his/her office, obviating the need to physically travel to the imaging department, which was far more workflow efficient. At the same time, the widespread adoption of speech recognition software changed report transcription and turnaround, which was now measured in hours (or even minutes). These combined factors not only caused a dramatic change in imaging and report accessibility and timeliness, but indirectly modified report evaluation, from reporting content and consultation, to reporting workflow. In the analog imaging practice, essentially all reports required days to receive, thereby promoting radiologist–physician consultations. As a result, many physicians evaluated radiologist performance by the perceived quality of the report and consultations. Once the transition to digital imaging was complete and images/reports made readily available, these consultations became less necessary [4]. While report content remained important, an increasing focus of imaging performance evaluation was on report turnaround time and efficiency of report delivery.

In addition to these changes in imaging data accessibility and timeliness, other profound technologic and economic changes were taking place inside of the radiology department affecting deliverables. The advent of PACS provided a mechanism in which radiologist service was no longer required on site, and more service providers utilized teleradiology for radiology outsourcing. This assisted in addressing practical challenges related to increasing exam complexity and volume, but made radiologists less accessible to consultations. While phone conversations remained a viable alternative, the increasing workload demands and time constraints facing clinicians, lack of familiarity between the parties, and relative lack of technologic support (regarding remote consultation functionality) have made remote consultations relatively inefficient and less desirable. While radiologists would normally be expected to proactively promote consultations to address these practice changes, the increasing workload, exam complexity, and service demands placed upon them have created

an environment of relative indifference. This indifference has arguably been further aggravated by continued declines in reimbursement and the commoditization of radiology services [5]. In an attempt to maintain revenue, many radiology providers opt to optimize productivity and workflow, which has the potential to further reduce consultations.

The lack of interpersonal communication (among multiple stakeholders) has adversely affected data accessibility and understanding, which in turn has the potential to negatively impact clinical outcomes. While encouraging more face-to-face communication would serve as an important step to counteract these trends, this would be the equivalent of trying to put the genie back in the bottle. Technology has served as the principle catalyst of negative change in reporting and communication and, if properly channeled, can also serve as the catalyst for improvement. Reporting strategies (and technologies) must begin to adapt to these changing needs by serving as a proactive source of collaboration, consultation, education, and customization.

The Criticality of Communication in Medicine

Breakdowns in verbal and written communication between healthcare providers have been shown to be a common occurrence [6], with a well-established relationship between effectiveness of communication and healthcare outcomes [7, 8]. A number of factors contribute to existing communication deficiencies including (but not limited to) lack of communication structure and standardization, diffusion of responsibility, deficiencies in communication style, and ethnic and language differences [9, 10].

Interspecialty communication among physicians has been shown to have increasing importance as medical subspecialization and technologic advances fragment medical care across numerous physician and institutional providers [11]. Measures of “meaningful use” and coordination of care should include a methodology which can record, track, and confirm communication and task completion [12]. A critical determinant of effective interphysician communication is *reciprocity*, in which both physicians share a reciprocal duty for accurate, timely, and verifiable information exchange.

A great deal of research has been devoted to investigating the criticality of communication between healthcare providers and patients and the subsequent impact on healthcare outcomes. The Institute of Medicine has found that one important root cause of inequality of care and adverse clinical outcomes among minority patient populations is ineffective communication [13]. This has led to the creation of patient-centered communication strategies for improving physician–patient relationships and improving quality of care [14, 15]. As patients become more empowered, greater expectations are being placed upon healthcare providers to

improve communication and engage patients in decision making. These heightened communication requirements extend to all stakeholders throughout the healthcare continuum and should provide an impetus for innovative communication technologies which can systematically record, store, disseminate, and analyze standardized medical data in a context and user-specific manner.

Communication in Radiology: Current Practice and Inefficiencies

An effective communication strategy in radiology practice has been reported to contain three essential components: timeliness, consultation, and reliability [16]. Expectations for report finding communications is in large part dependent upon whether the report findings are categorized as routine or non-routine. Non-routine reports include findings requiring immediate or urgent action, findings which are discrepant from a preceding interpretation, and findings which could be seriously adverse to the patient's health and are unexpected by the physician (i.e., urgent, discrepant, unexpected) [16]. In reality, these "non-routine" definitions are inherently vague and as a result introduce potential discrepancy on the part of the interpreting radiologist and referring clinician as to what should and should not be classified as non-routine. In the end, the more definitive and less ambiguous these standards are, the better for all parties in defining expectations and communication requirements.

While the expectation for communication of radiology report findings has historically been focused on radiologist-referring clinician interactions, substantive changes are taking place which expand communication requirements to include the patient [17]. As the patient empowerment trend continues to expand, patients are increasingly demanding direct access to their medical data, along with the ability to directly consult with all medical providers, including radiologists. This concept of radiologist–patient communication is certainly not new and has for years been mandated by the Mammography Quality Standards Act (<http://www.fda.gov/CDRH/MAMMOGRAPHY>), which has improved patient care and reduced medical malpractice lawsuits due to delayed breast cancer diagnosis [17]. Extending radiologist–patient communication of report findings to all medical imaging exams could lead to further improvements in patient care and reduced lawsuits related to communication errors and/or delayed diagnosis. Communication failure involving radiologic report findings has been shown to be a significant cause of malpractice litigation, with radiologist defendants found to be responsible in 25 % of malpractice settlements [18]. The average indemnity payment for primary errors in communication by radiologists was \$228,000–\$236,000, which was twice as high as when appropriate communication occurred

[19]. According to the Physician Insurers Association of America, communication errors in radiology were among the top five reasons radiologists are sued in medical malpractice cases [20]. The potential for communication failures will only increase as the complexity and volume of medical data continue to increase.

This extension of physician–patient communication has been further advocated by the American Medical Association's Code of Medical Ethics, which states that patients have a right to know the results of their diagnostic tests and that physicians have an ethical responsibility to ensure they receive them [21]. This proposal to mandate direct radiologist–patient communication throughout medical imaging practice provides a theoretical opportunity for radiologists to become more intimately involved in patient care, which can in turn create added value and service differentiation within the radiologist community [22]. The challenge is to create a practical and economic methodology for accomplishing these lofty goals, without placing unrealistic demands on radiology service providers, who are already challenged to meet existing workload demands.

Communication in Radiology: Future Goals

If the ultimate goal in radiology service delivery is to improve and expand communication of report findings to the broad and diverse community of radiology consumers, innovation is required at both the levels of the radiology report (i.e., data source) and communication schema. Expecting radiologists to personally communicate findings from each individual report with referring clinicians, consultants, and patients is impractical given existing workload (and economic) constraints. At the same time, it is essential that the radiologist community recognizes that maintaining the existing communication status quo is a risky and self-defeating proposition.

The answer ironically lies in some of the original sources of the problem, which include the radiology report, information system technologies, and complexity of the imaging dataset. As long as the radiology report remains in its current free text format, devoid of data standardization and integration with the imaging dataset, communication of findings will largely remain a separate and distinct process from the radiology report itself. This will place an untenable burden on the part of the radiologist to initiate direct communications with referring clinicians and patients unless indirect communication strategies (e.g., written letters) are utilized, which arguably defeats (or limits) the effectiveness of the intended purpose. At the same time, outsourcing communication responsibilities to third parties (e.g., technologists, clerical staff) introduces a potential source of error and misunderstanding, while also limiting the positive impact direct interpersonal communication could provide in creating goodwill and added value. The

solution therefore lies in the ability to create an image-centric report utilizing standardized data, which in turn can be used to create context and user-specific customizable communications. These image-centric communication instruments can in turn be used to support ongoing consultations between the parties, in which additional questions can be addressed and follow-up data can be recorded. Specific innovation and implementation strategies will be discussed in a separate article in order to expand on these ideas and provide greater insight as to how this can be integrated into existing workflow and information system technologies. The ultimate goal is to transform the radiology report into a customizable tool for multipurpose communication, while simultaneously providing a vehicle for consultation, education, and research.

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