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An Asynchronous Online Collaboration Between Radiologists and Patients: Harnessing the Power of Informatics to Design the Ideal Patient Portal

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INTRODUCTION

Patient portals (also known as patient health records) are now offered both by large health systems and by small private practices [1]. They enable patients to schedule appointments, e-mail providers, access test results, and even download their entire medical histories. However, few offer direct access to medical images or direct communication with radiologists. If you had to design the ideal patient portal that also included access to diagnostic imaging, how would you determine what features it would need to support? Would you (1) consult PACS engineers to identify relevant technical specifications and challenges, (2) convene an expert panel to discuss features that would maximize the dissemination of information and minimize interruptions to radiologists, or (3) connect radiologists, patients, and referring physicians from around the country and ask what would be most useful to them?

The role of the radiologist in patient care has evolved over the past decade [2]. One of the tenets of the Imaging 3.0® framework, championed by the ACR, is the involvement of a radiologist in every step of a patient's imaging-related care: before, during,

and after an examination or procedure [3]. To emphasize and guide this culture change in radiology, the ACR created the Commission on Patient- and Family-Centered Care (CPFCC) in July 2015 [4]. Consisting of committees on economics, informatics, outreach, and quality experience, each of which includes patients as equal members, the goals of the CPFCC are to guide practices in improving the experience of patients and their families, inform the identification and monitoring of patient outcomes in radiology, and help ACR members navigate evolving payment models and requirements. In particular, the Informatics Committee seeks to improve patients' and families' engagement and experiences when interacting with the information systems and services used in radiologic care and to use informatics resources to better align care delivery with the principles of Imaging 3.0. A recent online discussion among patients, referring physicians, and radiologists illustrates the power of this type of multistakeholder collaboration and the potential for informatics to improve not only patients' and families' experiences but also the overall delivery of care.

The Informatics Committee has met on multiple occasions over the

past year to discuss issues and challenges to patient- and family-centered care in radiology that can be addressed by informatics solutions. Opportunities for improvement that have been identified include developing more efficient, less onerous methods for sharing images with patients and referring physicians and between facilities; enabling patients to access, consume, and understand their own and their family members' radiology reports; facilitating conversations between radiologists and patients to explain upcoming imaging as well as discuss findings and results; and enabling both patients and referring physicians to provide meaningful feedback to radiologists about the interpretations they receive.

METHODS

According to the Institute for Patient- and Family-Centered Care, there are four concepts of patient- and family-centered care: respect and dignity, information sharing, participation, and collaboration [5]. Earlier this year, members of the CPFCC were tasked with compiling a list of resources radiology practices could use to better align themselves with these principles. Patients, referring

physicians, and radiologists all shared ideas in a collegial, nonadversarial fashion. Each group not only described the challenges they face in their respective roles but also made suggestions on how the process and interactions could be improved. The conversation quickly focused on how informatics tools could be used to facilitate and improve communication between patients and radiologists. Because the conversation occurred over the course of nearly 3 weeks, there was an opportunity not only for responses to the original question but also for interactive discussion in an iterative fashion.

RESULTS

The question was shared by e-mail with the 72 members of the CPFCC, and a discussion unfolded over the subsequent 2.5 weeks. Forty-one messages were exchanged asynchronously over e-mail among 27 patients, referring physicians, and radiologists, all sharing ideas in a collegial, nonadversarial fashion. Nine participants in the conversation contributed more than one message, with two participants, one a patient member of the CPFCC, contributing four messages each. As described subsequently, the aforementioned principles of patient- and family-centered care were recurring themes in the discussion.

Patients described the expectation that radiologists will communicate results to them and that both they and their physicians, who ordered the imaging, in turn, should have the ability to provide feedback to radiologists as to the utility of a particular interpretation [6]. Radiologists and patients both debated the nature of the feedback and compared a simple social media–type "thumbs up" button

with a more detailed survey. Proponents of the one-click response over the survey pointed out the value of more immediate, report-specific feedback and the ability to obtain this feedback from both referring physicians and patients. They also noted that surveys would provide information only on the general utility of radiology reports, rather than the specific value of an interpretation to a particular patient's care. Other discussants felt that the one-click response did not provide sufficient information; if a referring physician responded "no" when asked if an interpretation was helpful, direct follow-up with that physician would still be necessary to obtain any actionable feedback.

One radiologist noted that the best way to get feedback from referring physicians is to establish a personal rapport by telephone rather than to rely on electronic communication. However, at least one referring physician noted that although she often wants to offer feedback, she finds it difficult to find the contact information for interpreting radiologists. Although this is not universal, a number of radiologists responded to say that their practices now include the interpreting radiologist's contact information at the bottom of a report, so that both patients and referring providers can call and speak to their radiologists.

The patient advocate members of the CPFCC applauded the efforts of the radiologists in the discussion to achieve more direct communication among patients, caregivers, and radiologists. The multifactorial need for this communication was discussed in detail. Because patients often do not meet the radiologists interpreting their imaging examinations, it is difficult for them to

establish rapport with or build trust in those particular physicians, compared with the other physicians who participate in their care. Without this rapport, the four principles of patient- and family-centered care described earlier automatically become more difficult to achieve. Conversely, direct communication between patients and radiologists empowers patients to become active participants in their care, rather than passively experiencing the health care journey.

One referring physician described her patients' specific sources of frustration with radiology: not always understanding why an imaging test is necessary, not being involved in the decision-making process leading to an imaging order, and not being able to understand the interpretation that is written for the referring physician audience rather than for the lay audience. Although it is common in mammography to generate both an interpretation for the ordering physician and a lay-language interpretation for the patient, this is almost never done in other subspecialties of radiology. Recent work by Oh et al [7] demonstrated a system that annotates radiology reports with lay-language definitions of terms and illustrations of concepts, and this was applauded by some of the discussants as an important addition to patient portals.

The inclusion of a summary statement at the end of a radiology report, perhaps automatically generated by a natural language processing algorithm, was also suggested as another option to improve the accessibility of information to both patients and referring physicians. Although currently available algorithms are not sufficiently mature to