Referring Provider Perceptions of Standardized Reporting for Possible Abdominal Cancer

Caroline E. Sloan, MD, Seetharam C. Chadalavada, MD, MS, Darco Lalevic, BS, Tessa S. Cook, MD, PhD, Hanna M. Zafar, MD, MHS

DESCRIPTION OF THE PROBLEM

Cancer imaging coding schemes, such as BI-RADS®, can improve provider and patient communication through standardized report content, consistent lesion classification, and actionable language [1]. Our main hospital uses a standardized assessment coding scheme on all abdominal imaging examinations to clearly communicate the malignant likelihood of focal masses in the liver, adrenal glands, kidneys, and pancreas [2]. Radiologists are required to provide structured follow-up recommendations for all focal masses that are indeterminate for cancer, including imaging modality and time interval. Through automated mining of radiology reports, patients with codes corresponding to imaging findings of possible cancer can be identified and monitored. Nine months after implementation, we surveyed generalists and subspecialist referring providers who order abdominal imaging at our main hospital to gauge their perceptions of whether this coding scheme affected report interpretation and patient management, their preferences for radiology report recommendations, and existing systems to monitor follow-up of abnormal imaging results.

WHAT WE DID

The Coding System

The coding system used by the Department of Radiology at our main hospital has been applied to all abdominal MRI, CT, and ultrasound examinations since July 2013. This scheme uses nine uniform codes (0 through 7 and 99) to describe five categories of lesions: benign, indeterminate for cancer, suspicious for cancer, known cancer, and nondiagnostic (Appendix 1). Codes and recommendations align with existing cancer imaging coding schemes and are applied regardless of study indication and care setting.

The Survey

Our 789-bed hospital employs approximately 1,870 physicians and performs more than 30,000 abdominal MRI, CT, and ultrasound examinations annually. In March 2014, we conducted an online survey of all emergency department, outpatient, and inpatient physicians, nurse practitioners, and physician assistants from primary care and subspecialty fields known to order abdominal imaging examinations. Ten of the 20 questions in the survey focused on (1) perceived impact of the coding scheme on radiology report clarity and patient management, (2) radiology report recommendation preferences, and (3) reported methods of monitoring follow-up among patients with abnormal imaging findings (Appendix 2). Four invitations to participate in the survey were issued over a 2-month period by the study team, the radiology department chair, and the chief medical officer of our health system. Providers could choose to respond to some or all of the survey questions. Survey responses were deidentified and stratified by specialty (generalist vs subspecialist) using proportions. Our institutional review board approved this study.

WHAT WE FOUND

Among 405 referring providers invited to participate in the survey, 82 (20%) responded (Table 1), and 84% of surveys were answered completely (69 of 82). Most survey respondents ordered abdominal CT examinations or ultrasound examinations daily or at least once a week (53 of 82 [64%] and 45 of 82 [55%], respectively).

Perceived Impact of Focal Mass Coding Scheme

Nine months after the implementation of a standardized coding scheme for reporting abdominal imaging findings of possible cancer, 89% of

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Table 1. Characteristics of survey respondents (n = 82)

	n	%
Women	41	50
Specialty		
Generalists		
General internal medicine	23	28
Internal medicine-pediatrics	2	2
Family medicine	1	1
Subspecialists		
Hematology and oncology	18	22
Emergency medicine	7	9
Anesthesiology	6	7
Gastroenterology	6	7
Urology	5	6
General surgery	4	5
Nephrology	4	5
Obstetrics and gynecology	4	5
Geriatrics	1	1
Unknown	1	1
Clinical setting		
Primarily outpatient	50	61
Primarily inpatient	25	30
Emergency care	7	9
Clinical experience (y)		
<5	18	22
6-15	31	38
>15	33	40

respondents (73 of 82) knew that the system existed. Nearly half of referring providers indicated that the coding scheme was clear or very clear (39 of 82 [48%]), and 20% were neutral (16 of 82). Providers who indicated that the system was unclear or very unclear (27 of 82 [33%]) stated that it was an "unfamiliar scale" and that the standard language was confusing. Specific examples of confusing language included the presence of the term *focal mass* before the code for "no mass" and the term *MAC*, standing for "mass assessment code," before each code. Generalists were more likely to find the coding scheme clear or very clear (16 of 26 [62%]) compared with subspecialists (22 of 55 [40%]); similar proportions of generalists and specialists found the system unclear or very unclear (7 of 26 [27%] and 20 of 54 [37%], respectively).

The coding scheme affected radiology report interpretation for half of providers (40 of 75 [53%]), mainly by providing consistent terminology (22 of 76 [29%]) and facilitating the identification of focal masses (20 of 76 [26%]) (Fig. 1A); generalists were more likely to select these options (17 of 24 [71%]) than subspecialists (22 of 51 [43%]). Nearly half of providers indicated that the coding scheme affected patient management "some" or "a lot" (34 of 74 [46%]) (Fig. 1B); these options again were selected by a greater proportion of generalists (15 of 23 [65%]) than subspecialists (18 of 50 [36%]).

Preferences for Radiology Follow-Up Recommendations

Nearly two-thirds of referring providers (49 of 76 [64%]) wanted radiology reports to include follow-up recommendations for indeterminate focal masses either "most of the time" or "always" (Fig. 2A). Almost all generalists desired recommendations (22 of 24 [92%]), compared with half of subspecialists (27 of 51 [53%]). One subspecialist commented, "It is helpful to know what the radiologist thinks about the need for follow-up. I don't always follow the recommendations, but it offers a starting point and some helpful guidance." Another subspecialist stated that radiology report recommendations should be provided consistently otherwise, "inexperienced people [are left] to interpret what the radiologist writes in the narrative." One provider among the 7% of respondents (5 of 76) who "rarely" or "never" desired follow-up recommendations stated that radiologists' recommendations are "based on minimal history and no physical exam." When asked what type of information they preferred to see in radiology report recommendations, 87% of referring providers (65 of 75) desired both a modality and a time frame for follow-up. Similar proportions of generalists (23 of 24 [96%]) and subspecialists (41 of 50 [82%]) (Fig. 2B) selected this response.

Patient Monitoring Practices

Nearly 40% of all providers (29 of 75 [39%]) reported no mechanism for managing follow-up of abnormal imaging results (Fig. 3); generalists were twice as likely to have no mechanism of managing follow-up of abnormal results than subspecialists (14 of 24 [58%] and 14 of 50 [28%], respectively). Few providers had dedicated office personnel to monitor follow-up (9 of 75 [12%]). Most providers who reported monitoring systems for follow-up relied on electronic medical record flags that notified them of new test results (25 of 75 [33%]) or review of test results with patients at their subsequent office visits (21 of 75 [28%]).

DISCUSSION AND NEXT STEPS

Less than a year after implementation, half of the providers who responded to our survey indicated that the standardized coding scheme used for abdominal radiology examinations at our main hospital was clear and perceived a positive effect on report review and patient management. On the basis of direct feedback from the one-third of referring providers who found the system "unclear" or "very unclear," we have removed confusing terminology from the standardized language, such as the term *MAC*, and instead