Lack of Timely Follow-Up of Abnormal Imaging Results and Radiologists' Recommendations

Aymer Al-Mutairi, MD[a,b], Ashley N. D. Meyer, PhD[a,c], Paul Chang, MD[d], Hardeep Singh, MD, MPH[a,c]

Abstract

Purpose: Abnormal imaging results may not always lead to timely follow-up. We tested whether certain aspects of communication in radiology reports influence the response of the referring providers, and hence follow-up on abnormal findings.

Methods: We focused on 2 communication-related items that we hypothesized could affect follow-up: expressions of doubt in the radiology report, and recommendations for further imaging. After institutional review board approval, we conducted a retrospective review of 250 outpatient radiology reports from a multispecialty ambulatory clinic of a tertiary-care Veterans Affairs facility. The selected studies included 92 cases confirmed to lack timely follow-up (ie, further tests or consultations, treatment, and/or communication to the patient within 4 weeks), as determined in a previous study. An additional 158 cases with documented timely follow-up served as controls. Doubt in the narrative was measured by the presence of key phrases (eg, "unable to exclude," "cannot exclude," "cannot rule out," "possibly," and "unlikely"), in the absence of which we used reviewer interpretation. A physician blinded to follow-up outcomes collected the data.

Results: Patients whose reports contained recommendations for further imaging were more likely to have been lost to follow-up at 4 weeks compared with patients without such recommendations ($P = .01$). Language in the report suggestive of doubt did not affect the timeliness of follow-up ($P = .59$).

Conclusions: Abnormal imaging results with recommendations for additional imaging may be more vulnerable to lack of timely follow-up. Additional safeguards, such as tracking systems, should be developed to prevent failure to follow up on such results.

Key Words: Follow-up, abnormal tests, radiology reporting, doubt, diagnostic error

J Am Coll Radiol 2015;12:385-389. © 2015 Published by Elsevier on behalf of American College of Radiology

INTRODUCTION

Previous studies indicate that abnormal imaging results may not lead to timely follow-up even when they are transmitted to the ordering provider as electronic alerts [1-3]. For instance, we found that 8% of abnormal imaging results did not receive follow-up actions by referring providers within 4 weeks [1], potentially contributing to suboptimal patient outcomes [4]. Additionally, lack of timely follow-up might be linked to malpractice claims [5,6], in which liability is typically shared between the referring physician and the interpreting radiologist [7]. Abnormal findings may be lost to follow-up for any

[a]Houston VA Center for Innovations in Quality, Effectiveness and Safety, Michael E. DeBakey Veterans Affairs Medical Center, Houston, Texas.

[b]Department of Family and Community Medicine, Baylor College of Medicine, Houston, Texas, USA.

[c]Section of Health Services Research, Department of Medicine, Baylor College of Medicine, Houston, Texas, USA.

[d]Division of Radiology Informatics, Department of Radiology, University of Chicago Medical Center, Chicago, IL.

Corresponding author and reprints: Aymer Al-Mutairi, MD, VA HSR&D Center of Innovation (152), 2002 Holcombe Boulevard, Houston, TX 77030; e-mail: almutair@bcm.edu.

The views expressed in this article are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs or any other funding agency.

Funding: This work is supported by the VA Health Services Research and Development Service (CRE 12-033; Presidential Early Career Award for Scientists and Engineers USA 14-274), the VA National Center for Patient Safety and the Agency for Health Care Research and Quality (R01HS022087), the Houston VA HSR&D Center for Innovations in Quality, Effectiveness and Safety (CIN 13-413) and a primary care research training grant from the Health Services and Resources Administration (HRSA, institutional training grant number T32HP10031).

1546-1440/15/$36.00 ■ http://dx.doi.org/10.1016/j.jacr.2014.09.031

number of reasons, although suboptimal communication often emerges as a common contributing factor [6,8-10].

Radiology reports are the primary means of communication between a radiologist and the referring physician [7,11]. Reports often state abnormal findings and the radiologist's recommendations for further testing. Many physicians feel medically and legally obligated to follow these recommendations [12,13]. However, radiology reports occasionally contain language that conveys doubt or uncertainty regarding the results [14]. Specifically, expressions of doubt may contribute to a sense of ambiguity about how to further manage a patient's condition, resulting in a lack of timely follow-up. Similarly, recommendations for additional testing require physicians to take additional steps to investigate the problem in the midst of their otherwise busy daily schedule. Some of these follow-up tasks might be delegated to other care team members.

Of the Veterans Affairs (VA) providers we surveyed previously [15], 83% wanted to be able to set reminders for themselves for future actions, a feature that was missing from the electronic health record (EHR) they used. A qualitative study confirmed that providers noted similar challenges with tracking of abnormal test results [16]. Many providers rely on patients' next visit to notify them of their abnormal test results [1,15]. Thus, recommendations for further imaging to follow up on the abnormality noted in the report might be more vulnerable to follow-up problems. To examine these communication issues further, we tested the association between information contained in radiologists' reports and follow-up outcomes. We hypothesized that recommendations for further imaging, and expressions of doubt or uncertainty in the radiology report, are more likely to be associated with lack of timely follow-up.

METHODS

We performed a retrospective review of radiology reports from 250 unique patients. This cohort was a subset of a larger cohort of patients included in a previous study [1] that examined follow-up of abnormal imaging report-related alerts in the VA's EHR. Radiologists in the VA use a structured code to flag abnormal reports as alerts to providers' EHR in-boxes. In this study, we identified all alerts for abnormal imaging transmitted electronically in a multispecialty outpatient setting in a large VA ambulatory clinic and 5 of its satellite clinics. A total of 1,196 consecutive patients had abnormal imaging, and these included both new and established patients. In the previous study, we conducted medical record reviews to evaluate for follow-up actions on the abnormal imaging results.

We defined timely follow-up as any of the following within 4 weeks of the imaging study: patient notification of the test result; a follow-up test or consultation; documentation addressing abnormal imaging in the medical record, any medical or procedural treatments for the specified abnormality; or ordering the recommended follow-up test or imaging study or making a referral for one of these to be performed in the future [1]. If no follow-up actions were documented, we called the ordering providers to determine any follow-up actions they might have taken without documenting them. All of these patients had EHR-generated alerts that were confirmed to have been transmitted to providers' EHRs, of which 92 were lost to follow-up at 4 weeks [1].

For our current study, we first included all 92 reports that were identified as lacking timely follow-up at 4 weeks. We then randomly selected 158 reports from 1,104 cases with timely follow-up actions [1], to reach a total sample size of 250 (Fig. 1). The 250 studies included x-rays (n = 127; 50.8%); CT (n = 82; 32.8%); MRI (n = 15; 6%); ultrasound (n = 25; 10%); and mammography reports (n = 1; 0.4%) dictated by radiologists.

We developed a standardized data collection tool to record the presence or absence of recommendations for further imaging and expressions of doubt in the radiology reports. We also noted whether the radiologist recommended a specific timeframe for the follow-up imaging test. Abnormal imaging reports could contain other

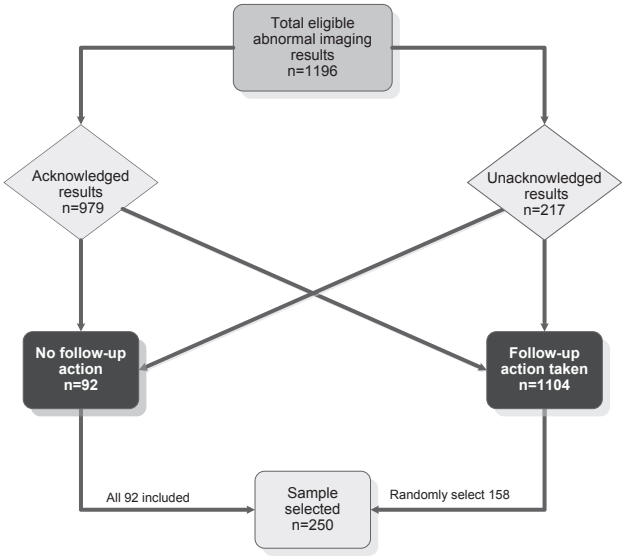

Fig 1. Patient Selection Process.