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Complexity of medical decision-making in care provided by surgeons through patient portals



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ABSTRACT

Background: Patient portals are online applications that allow patients to interact with healthcare organizations and view information. Portal messages exchanged between patients and providers contain diverse types of communications, including delivery of medical care. The types of communications and complexity of medical decision-making in portal messages sent to surgeons have not been studied.

Materials and methods: We obtained all message threads initiated by patients and exchanged with surgical providers through the Vanderbilt University Medical Center patient portal from June 1 to December 31, 2014. Five hundred randomly selected messages were manually analyzed by two research team members to determine the types of communication (i.e., informational, medical, logistical, or social), whether medical care was delivered, and complexity of medical decision-making as defined for outpatient billing in each message thread.

Results: A total of 9408 message threads were sent to 401 surgical providers during the study period. In the 500 threads selected for detailed analysis, 1293 distinct issues were communicated, with an average of 2.6 issues per thread. Medical needs were communicated in 453 message threads (90.6%). Further, 339 message threads (67.8%) contained medical decision-making. Overall complexity of medical decision-making was straightforward in 210 messages (62%), low in 102 messages (30%), and moderate in 27 messages (8%). No highly complex decisions were made over portal messaging.

Conclusions: Through patient portal messages, surgeons deliver substantial medical care with varied levels of medical complexity. Models for compensation of online care must be developed as consumer and surgeon adoption of these technologies increases.

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Introduction

Patient portals are online applications that enable patients and their caregivers to interact with healthcare providers and view health information.¹⁻³ The United States government defines a patient portal as “a secure online website that gives patients convenient 24-hour access to personal health information from anywhere with an Internet connection.”¹ Implementation of patient portals by healthcare systems is increasing in response to consumer demand and government incentives such as the Meaningful Use criteria created by the Health Information Technology for Economic and Clinical Health Act.⁴⁻⁸ Patient portals are typically managed by a healthcare institution and allow patients to have access to personal health information, including recent doctor visits, discharge summaries, medications, immunizations, allergies, and laboratory results. Most advanced portals enable patients to exchange secure messages with their providers, and secure messaging is one of the most popular functions of patient portals.⁵

Little research has focused on the classification or description of secure messaging through patient portals, and most prior work has been performed in primary care or medical specialty settings.^{9,10} North et al. manually classified 323 messages in the primary care setting at a large academic medical center, demonstrating that 91% of messages were related to the direct medical care of the patient, including medication, symptom, or test-related content.⁹ Another study of 1207 patient portal messages sent to an adult multispecialty neurology clinic revealed that 45% contained clinical questions, 35% consisted of administrative questions, and the remainder addressed refill requests or nonclinical issues.¹¹ A small mixed-methods study of veterans' experiences using secure messaging in the My HealthVet patient portal characterized 66 messages sent by 18 unique participants into four user-selected categories (i.e., general, appointment, medication, and test). Ninety-four percent of messages contained content from at least one of these categories, but patient-chosen categories were found to be inconsistent.¹⁰ One study of 3253 patient portal messages from a large academic medical center including all clinical specialties found that 72% involved medical needs or communications.^{12,13} It is unknown if these findings are representative of secure messaging content in acute care or surgical specialty settings.

Prior research has demonstrated that after broad deployment of a patient portal across clinical specialties, surgeons were the second most frequent specialty to participate in patient-provider messaging.¹⁴ Furthermore, messaging adoption by surgical patients and providers grew rapidly across surgical subspecialties.¹⁵ Although providers conduct growing numbers of online encounters by exchanging messages with patients through such portals, the nature of such communications has not been analyzed for surgery.^{14,15}

Utilization of technologies has been proposed as a central method of optimizing performance and reducing costs of the healthcare system.^{16,17} Although the Health Information Technology for Economic and Clinical Health Act encouraged

healthcare organizations to implement health information technologies such as patient portals, models for characterizing the utilization and evaluating the effectiveness of patient portals are lacking. As patient portal and secure messaging adoption increase, understanding the nature of portal messaging interactions and their implications for provider workload becomes important. With expanding integration of health technology into patient care and as payment models evolve, nonconventional forms of care must be identified and quantified to support potential reimbursement strategies. We therefore sought to characterize the types of communications in secure messaging, amount of medical care provided, and complexity of medical decision-making in the care delivered through patient portal messaging by surgical providers at an academic medical center to examine the potential for reimbursable care provided through portal messaging.

Materials and methods

Setting

The study was performed at Vanderbilt University Medical Center (VUMC), a private, nonprofit institution that provides primary and regional referral care to more than 500,000 patients annually with more than 900 inpatient beds and more than 1 million outpatient visits per year. VUMC consists of both Vanderbilt University Hospital, which cares for primarily adults, and Monroe Carell Jr. Children's Hospital at Vanderbilt.

In 2005, VUMC launched a patient portal, My Health at Vanderbilt (MHAV), for adult patients and deployed the portal widely across all clinical specialties.¹⁴ In 2007, accounts for pediatric patients and their parents or guardians were made available. MHAV provides a collection of common patient portal functions including access to selected portions of the electronic medical record, appointment scheduling, secure messaging with healthcare providers, account and bill management, and delivery of personalized health information.¹⁸ Meaningful Use financial incentives have increased the national implementation of patient portals. Although many institutions have adopted patient portals to meet Meaningful Use criteria, MHAV was developed well before the American Recovery and Reinvestment Act of 2009, which created Meaningful Use and has been promoted as a means of patient engagement since development. Secure messaging was a core function of MHAV present at release and has been avidly adopted by MHAV users without any specific promotion related to Meaningful Use. MHAV has had stable overall patient adoption of 25%-30% since 2010.

Secure messaging is one of the most used functions of MHAV, with patients sending more than 32,000 new messages to VUMC providers each month.¹⁹ Within MHAV, messages are directed to inboxes called *message baskets*, which may serve individual providers, specialty groups, or other clinical entities. These message baskets are typically managed by clinical care teams, which may include physicians, nurses, and allied health professionals within the same division, department, or other clinical unit. Each clinical unit routes

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