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Care Delivered by Pediatric Surgical Specialties Through Patient Portal Messaging



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ABSTRACT

Background: Patient portals are online applications that typically allow users to interact with providers using secure messaging. Portal messaging use and content have not been studied in pediatric surgical specialties.

Materials and methods: We obtained all message threads initiated by pediatric patients/caregivers and sent to pediatric surgical providers through the Vanderbilt University Medical Center patient portal from June 1, 2014 to December 31, 2014. We collected patient demographics and providers' surgical specialties. We determined the number of message threads and individual messages sent by patients/caregivers and providers by specialty. Message content was analyzed by semantic types using a validated consumer health taxonomy.

Results: Most threads were about male (176, 60.3%), white (239, 81.8%), non-Hispanic (278, 95.2%) patients with a median age of 6 y (range: 0–21 y). A total of 292 message threads containing 1679 individual messages were sent with mean 5.8 (standard deviation [SD] 5.0) messages per thread. Messages were sent more frequently regarding younger patients ($P = 0.001$). Physicians directly contributed to 161 (55%) message threads. Otolaryngology received the most threads (123, 42.1%) and messages (790, 47.1%). Specialties exchanging the most messages per thread were cardiac surgery (mean 7.0, SD 11.7), and dermatology (7.0, SD 6.9). Most message threads (273, 93.5%) involved delivery of medical care with 123 (42.1%) involving appointments/scheduling; 99 (33.9%) medical problems; 81 (27.7%) treatments; 68 (23.3%) testing; and 29 (9.9%) referrals.

Conclusions: Pediatric surgeons deliver substantial care within portal messages exchanged with pediatric patients and caregivers. Institutions adopting portals should consider effects on provider workload and potential disparities in access to care.

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Introduction

Patient portals are secure online applications that allow patients and their caregivers to access personal health information and to interact with healthcare providers and systems.¹⁻³ Adoption of patient portals by healthcare institutions has increased with regulatory pressures such as meaningful use and consumer demands.⁴ Through most patient portals, users can exchange secure messages with providers, access electronic health record (EHR) information, schedule appointments, receive personalized health information, and pay bills.⁵⁻⁷

Systematic reviews about the effects of patient portal usage for adult patients have found some evidence for improvements in clinical outcomes, usually in the context of case management programs, and also showed increased medication adherence, patient safety, disease awareness and self-management, uptake of preventative care, satisfaction, and decreased office visits.⁵⁻⁸ While most studies about patient portals have focused on usage in adult populations, a systematic review in pediatrics provided some support for the positive effects of portal usage by pediatric patients and their parents.⁹ Recent studies about the use of patient portals for pediatric patients have found high parental satisfaction rates, convenience, ease of use, increased feelings of parents' abilities to manage chronic medical conditions, and improved health outcomes in children with chronic diseases.¹⁰⁻¹⁶

Patient-provider messaging is consistently one of the most popular functions of patient portals for both adult and pediatric populations, but most studies about patient portal messaging have been done in primary care or medical specialties.^{5-8,16-19} At our institution, we have observed rapid adoption of portal messaging across all clinical specialties after deployment of our patient portal with surgical specialties receiving the second (to medicine) highest volumes of patient-initiated portal messages.^{20,21} Our research team has also demonstrated that surgeons deliver medical care of varied complexity in most messages.²² In the 3 y after creation of portal access for pediatric patients, we observed that specialists in gastroenterology and endocrinology received more messages than pediatric primary care providers. This is in contrast to what was observed for adult patients, where primary care providers received the largest volumes of messages.^{20,23} To our knowledge, the uptake of patient-provider messaging in pediatric surgical specialties has not been examined.

The objective of this study was to characterize the adoption of patient portal messaging and to describe the content of messages exchanged with pediatric surgical specialists at an academic medical center with a broadly deployed patient portal with accounts for pediatric patients and their parents or legal guardians. We examined the demographic characteristics of the children for whom messaging was utilized as well as the volume and content of messages by pediatric surgical specialties.

Material and methods

This study was conducted at Vanderbilt University Medical Center (VUMC) and approved by the Vanderbilt University Institutional Review Board. VUMC is an academic, nonprofit

institution located in central Tennessee consisting of Vanderbilt University Hospital and Monroe Carell Jr. Children's Hospital at Vanderbilt (MCJCHV). MCJCHV is a free-standing, high-volume pediatric regional referral and pediatric level one trauma center with 16 operating rooms and 267 inpatient beds.²⁴ In 2017, the center provided 52,183 emergency room visits, 15,977 inpatient discharges, and 325,233 outpatient clinic visits, as well as 17,205 surgical procedures completed across 10 pediatric surgical specialties.²⁴

My Health at Vanderbilt (MHAV) is an online patient portal launched by VUMC in 2005 and promoted in adult outpatient clinics, with subsequent expansion to the pediatric patient population in 2007.²⁵ Although a locally developed system, MHAV offers the standard functions of most commercial patient portals; users are able to send secure messages to providers, access selected portions of the EHR, schedule appointments, receive personalized health information, and pay bills.²⁵ For a pediatric population, MHAV offers accounts for patients greater than age 13 y themselves and accounts for surrogates (i.e., parents or guardians) and delegates (i.e., other individuals authorized to communicate on behalf of the patient). Secure patient-provider messaging allows portal users to send messages to providers with an expected turn-around time of 1 to 2 business days. MHAV messages are handled by clinical groups; some providers answer their own messages directly, and others allow their messages to be triaged and managed by administrative assistants or clinical staff. MHAV messages are audited to ensure that messages are received by patients and answered by providers. Messages not read by patients can be returned to the sender to allow them to contact the patient by another means. Provider messages that are not answered are also addressed through other communication channels depending on specialty.

To examine adoption of messaging by pediatric surgical patients and providers, we obtained all message threads initiated on behalf of pediatric patients and sent to pediatric surgical providers through MHAV from June 1, 2014 to December 31, 2014. *Message threads* are sets of messages exchanged between portal users and healthcare providers. For pediatric patients, MHAV users include patients greater than age 13 y (i.e., self), surrogates, and delegates. All pediatric specialty surgeons, allied health professionals, nurses, and other administrative staff who responded to MHAV messages as a clinical care team will be referred to as "providers" in this article. Message threads were reviewed for direct physician (M.D., D.O., or O.D.) contribution to the surgical provider response(s). Messages sent to pediatric surgical providers for patients aged 21 y and younger were included in analysis to examine the period of transition to adulthood, during which time many patients continue to see pediatric surgical providers.

From usage logs and message content for the study period, we determined the number of message threads and number of messages per thread. For each message thread, we collected the demographics of the patient about whom the message was sent (i.e., sex, race, ethnicity, age), the role of the sender (i.e., self, surrogate, or delegate) and the surgical specialty receiving the initial message. Pediatric surgical specialties were organized by departmental structure as follows: cardiac

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