



Standardized text messages improve 30-day patient follow-up for ACS pediatric NSQIP cases

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Abstract

Purpose Thirty-day follow-up is a critical and challenging component of the American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP). We hypothesized the simplicity and immediacy of text messaging would increase response rates while reducing workload.

Methods For 6 months, text messages were the primary form of contact for first and second follow-up attempts. If no response, a phone call was made. Results of this protocol were compared to the previous 6 months when phone calls were the primary method.

Results The text message (TM) group had 298 cases and phone call (PC) group had 354. The first contact was successful in 63.8% of the TM group compared to 47.5% of the PC group. The second contact was successful in 15.4% (TM) and 16.9% (PC). In the third attempt, 3.0% answered the call in the TM group versus 9.3% in the PC group. Some families remained unreachable: 17.8% in TM group and 26.3% in PC group ($p=0.01$). When totaled, time spent to obtain caregivers' responses was over five times higher in the PC group (910 min) than the TM group (173 min) ($p=0.005$).

Conclusion Patient follow-up using text messaging has improved our follow-up rate while decreasing workload.

Keywords NSQIP · Follow-up · Text messaging · Quality improvement · Outcomes

Introduction

Thirty-day patient follow-up is a critical and often challenging component of the American College of Surgeon (ACS) National Surgical Quality Improvement Program (NSQIP). Postoperative follow-up is important to capture any potential complications and work to improve safety and quality of care. Surgical Clinical Reviewers (SCRs) are expected to make a minimum of three attempts at contacting patients for follow-up and sites must have a follow-up rate of at least 80% to be included in the ACS Semiannual Reports.

The high volume of phone calls needed to meet this goal can be a very time-intensive task for the SCR, while the option of mailing a letter is potentially costly and seldom successful. Text messaging is now a prevalent part of our daily lives and a common means of communication. According to Pew Research Center [1] in 2015, text messaging has surpassed phone calls as the most widely and frequently used basic phone application across all age groups with 97% of Americans texting weekly. Text messaging is inexpensive, user-friendly, and messages can be answered at the user's convenience making them less intrusive than a phone call. As a result, text messaging has been used in a variety of clinical scenarios with success [2–10]. We questioned if text messaging could also be applied to NSQIP follow-up. Our hypothesis was that the simplicity and immediacy of text messaging would increase our response rate for patient follow-up, while reducing SCR workload.

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Methods

This study is a retrospective review of a prospectively collected database. A quality improvement (QI) project was started in January 2017 using text messages as the initial form of contact for NSQIP follow-up. The responses were tracked in a de-identified database in a prospective manner. After 6 months of this new protocol (January–June 2017), the data were retrospectively analyzed and compared to the previous 6 months of phone calls only (July–December 2016). A waiver was obtained from our Institutional Review Board to review the data. For the QI protocol, a standardized text message, based upon the NSQIP phone call follow-up script, was created. It was constructed to remain Health Insurance Portability and Accountability Act (HIPAA)-compliant by eliminating patient identifiers (Fig. 1). Smartphone and web-based applications were chosen to send text messages. Text messages were the primary form of contact for the first and second attempts at follow-up. If no response was received after the second text message attempt, a phone call was made for the third attempt at contact. The text message was constructed so that we could focus on the patients

Hi, this is (SCR name) from the surgery department at XX Children's Hospital. I am following up to see how your child has been doing since the recent surgery. If there were no complications please respond "A." If there have been any concerns or complications such as an infection or a visit to an outside hospital, etc, please respond "B."

Fig. 1 Sample text message script

who had potential complications and screen out the ones that did not. If the parent/guardian responded “A,” meaning the patient had no complications, the text conversation was concluded with a “thank you” response from the SCR. If the response was “B,” meaning there was concern over a possible complication, a text message was sent requesting a convenient time to call and clarify the issues. There was no attempt to clarify the complication over text message, but instead phone calls were used to evaluate the circumstances. A NSQIP case was included in the texting protocol if the patient had no documented 30-day follow-up in the electronic medical record (EMR). A case was excluded from the texting protocol if English was not the preferred language or if there was any concern about the parent’s ability to understand the text message. The average time per phone call was calculated by averaging the time spent on 30 consecutive phone call attempts, and the same was done for text messages. The data were analyzed using Chi square for nominal data, and *t* tests for interval level data. It was analyzed using SPSS Version 24 (IBM Corp., Chicago, IL). A statistician then validated the statistical results.

Results

There were 354 cases in the phone call (PC) group and 298 cases in the text message (TM) group after excluding cases with documented 30-day follow-up in the EMR. The first contact was successful in 63.8% of the TM group compared to 47.5% of the PC group. The second contact attempt was successful in 15.4% (TM) and 16.9% (PC) of cases. In the third attempt, 3.0% answered the call in the TM group versus 9.3% in the PC group. When comparing the two protocols as a whole, the improved response rate in the texting group was statistically significant ($p < 0.0001$). The difference in overall response rates was 82.2% for the TM group and 73.7% for the PC group ($p = 0.01$). Despite three attempts at contact, some families remained unreachable: 17.8% in TM group and 26.3% in PC group (Table 1).

When including both answered and unanswered calls, SCR phone calls took 1.5 min on average and text messages took 0.3 min. Therefore, total time spent on follow-up

Table 1 Comparison of phone call and text message response rates:

	Phone call group (%)	Text message group (%)	<i>p</i> value
# of cases	354	298	
Response rates			
First attempt	47.5% (<i>n</i> = 168)	63.8% (<i>n</i> = 190)	< 0.0001
Second attempt	16.9% (<i>n</i> = 60)	15.4% (<i>n</i> = 46)	
Third attempt	9.3% (<i>n</i> = 33)	3.0% (<i>n</i> = 9)	
Lost to follow-up	26.3% (<i>n</i> = 93)	17.8% (<i>n</i> = 53)	
Overall response rate	73.7% (<i>n</i> = 261)	82.2% (<i>n</i> = 245)	0.01

was more than five times higher in the PC group, taking 910 min (15.2 h) compared to 173 min (2.9 h) in the TM group ($p=0.005$) (Fig. 2).

Discussion

Thirty-day follow-up is critical for accurate outcome data in NSQIP. ACS NSQIP stipulates that each site must complete 30-day follow-up on at least 80% of cases to be included in the semiannual reports. For each patient without 30-day follow-up documented in the medical record, SCRs should attempt to contact the family a minimum of three times to inquire about postoperative occurrences. The traditional methods of contact involve mailing letters or placing phone calls. In our experience, very few letters sent in the mail were returned. This could be due to lost mail, change of address, or lack of motivation or incentive to fill out and return the form. Phone calls have their own difficulties. We found that the first phone call attempt was unsuccessful in over 50% of cases, likely due to a variety of causes. Caregivers may reject unrecognized numbers or may be unable to answer during normal business hours when they are working. The phone number may be incorrect, or no longer valid. Families on pay-as-you-go phone plans may only have intermittent phone access. Voicemail inboxes are often full and the calls are rarely returned if a voicemail is left.

Text messages, on the other hand, have fewer limitations. Text messages are quick to read, do not require phone minutes and use little data. They are less intrusive than a phone call and can be read and responded to at the user's convenience. In addition, parents screening their calls can determine that the message is not from a telemarketer. Maher et al. [6] reported that participants found text messages less of a time commitment than phone calls and more private when received in public. Text messages were also easier to retrieve than voicemails, and participants responded to text messages

much quicker than voicemail messages. Lastly, by keeping the text message generic, participants did not report any confidentiality concerns. For these reasons, text messages have become the primary form of communication for people, surpassing phone calls [1].

Text messaging has been used in a wide range of health-care-related scenarios including appointment reminders, medication compliance, symptom tracking, and vaccine compliance [3, 8, 10–12]. Sending text messages to adolescent liver transplant patients improved their rates of laboratory testing, and in trauma patients, text messaging effectively tracked PTSD symptoms [9, 10]. Thiago et al. showed that text messaging improved adherence to antiretroviral therapy in HIV/AIDS [8]. Ahlers-Schmidt et al. [3] found that parents preferred text messaging with 98% interested in immunization reminders and 100% in appointment reminders. In a literature review, Kannisto et al. [13] found that text reminders improved healthcare outcomes in 77% of 60 studies reviewed. Due to the popularity of text messaging and positive results from previous studies, we decided to implement a text messaging protocol to investigate its feasibility for NSQIP patient follow-up.

Our first major concern was HIPAA compliance. The Health Insurance Portability and Accountability Act (HIPAA) ensures that patient privacy is maintained in all healthcare interactions. It is designed to be “flexible and comprehensive to cover the variety of uses and disclosures that need to be addressed” [14]. Protected health information (PHI) identifiers include: name, location, birth date, age, phone number, medical record numbers, among others [15]. On a non-secure platform, such as texting, information must be de-identified to maintain privacy. Thus, all potential identifiers, including name, gender, birthdate, etc, were removed from the standardized text message, to be considered de-identified. Early in our experience, we included the date of surgery in the message but have since removed that potential identifier. If the phone receiving the text messages were lost or stolen, it would not be possible to identify the patient based on this text message alone.

To maximize caregiver engagement, the ideal text message is concise, straightforward, and easy to understand. In addition to being easily understood, the text sent needs to prompt an answer that is unambiguous. We structured a text message that can be read in just a few seconds and avoids a yes/no response. If the response given was “A,” then we could feel confident that the caregiver had read the entire message, understood the question and appropriately responded. If the response was “B,” rather than a series of text messages that would certainly reveal PHI, a phone call was scheduled to further discuss the postoperative concerns. Because of the initial text message, the caregiver would now be expecting a call from the SCR and therefore, be more likely to answer the phone. In this way, text messaging was

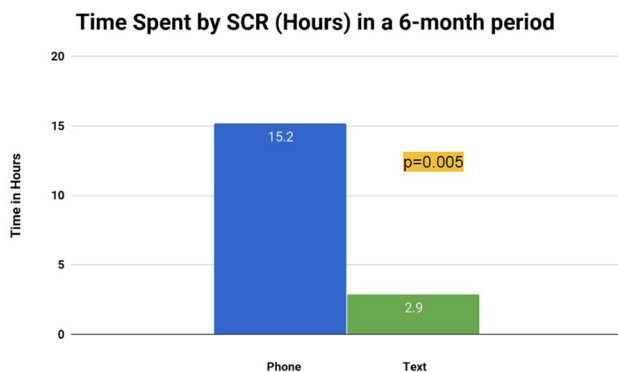


Fig. 2 Time spent by SCR, in hours, over a 6-month period phone call versus text message comparison

used to screen out the patients that had no concerns, so that the SCR could focus on the patients that had potential complications.

Over the 6-month period of text messaging, we received 14 “B” responses, resulting in two true NSQIP occurrences after speaking further with the caregivers. In the phone call group, only one call resulted in an actual NSQIP occurrence. We found no difference between phone calls and text messages in terms of identifying postoperative complications. As most patients return to clinic for follow-up if there is a postoperative problem, we are contacting families to identify a small subset of patients that most likely had no postoperative concerns. Because any patient with a potential complication received a phone call, the qualitative details about the nature of the complication remained the same between the two groups.

Clarity of the text message means little if caregivers still do not respond. When studying patients with inflammatory rheumatic diseases, Christie et al. [16] received a response rate of over 97% to text message surveys sent out, and the scores were found to be as valid as surveys completed on paper. Kew [17] received a 100% response rate when using text messages to track weekly symptom scores in IBS patients. Our data support these findings as well, with a statistically higher overall response rate of 82% in the text message group compared to 74% in the phone call group. In addition, patients and caregivers seem to prefer text messages for interacting with their healthcare professionals. Britto et al. [5] found that adolescents reported high ratings for usefulness, acceptability, and ease of use of the text messaging system with high levels of satisfaction. Day et al. [18] found improved patient satisfaction scores when patients received automated text messages. Although patient satisfaction was not a primary aim of this study, we were surprised by the number of positive responses from families who embraced this technology for patient follow-up. In fact, we received no negative comments about the process.

Text messages can also be more efficient than phone calls. Bigna et al. [7] found that text messaging was the most efficient and cost-effective method for reminders. Our data showed that one text message was as effective as two phone call attempts (Fig. 3), while taking a fraction of the time. Duane et al. [19] used text messages to collect data on UTI symptoms and found that responses were received within an hour. We also found that many responses were received within minutes of the text message being sent. Overall, text messages saved the SCRs 12 h during the 6 months of this study. Anecdotally, the SCRs also found that text messages were much easier and less stressful than phone calls, and that it improved their job satisfaction.

Despite the positive results, this study does have limitations. For instance, our text message requires that caregivers are English-speaking and literate. If the medical chart indicated

Phone Call vs Text Messaging Response Rate Comparison (%)

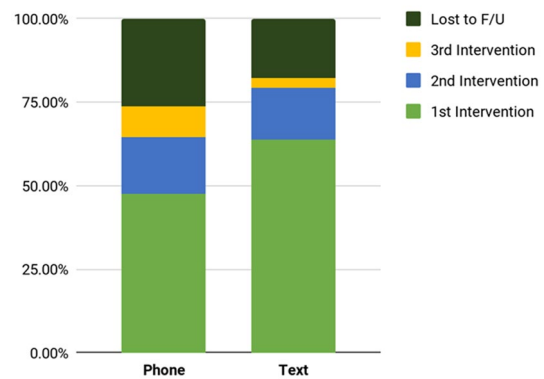


Fig. 3 Phone call versus text message response rate comparison

that English was not the preferred language of communication then this chart was excluded from the study, and a phone call was placed with an interpreter. If the text message prompted a “B” or any response other than “A,” such as “yeah” or “I don’t know,” then either there was a potential complication or the caregiver did not understand the question. There was never an attempt by the SCR to clarify this confusion further via text messages. Instead, these parents would receive a phone call. Secondly, it is possible the phone number in the medical chart was incorrect. At our institution, as part of the same-day admission process, phone numbers are verified by nurses and confirmed as the best method of contact. At that time, many parents also choose to receive text message updates during their child’s surgery. Still, to guard against any loss of privacy from an incorrect phone number, the text message was constructed without any patient identifiers. Only the parent would understand to whom the text message referred to. Finally, we are assuming that if a caregiver answers “A,” that this response applied to the entire post-operative course and not just to that particular moment in time. It is possible that there may have been a complication (such as a wound infection) that was treated and no longer a cause for concern. Theoretically, the parent may choose to answer “A” because the patient is not currently being treated for anything. One way to confirm that the text messages are successfully capturing accurate responses would be to follow up every text message with a phone call to ensure that the caregiver truly understood the text and there were no complications being missed. This could be the subject of a future study.

Conclusion

The text messaging protocol implemented in January 2017 resulted in an improved 30-day follow-up rate when compared to phone calls. In addition, text messaging was found

to be more efficient and well-received, taking 80% less time to complete. While not without its limitations, text messaging has allowed SCRs to streamline their workload, leaving more time available for NSQIP-related quality improvement projects. With the increasing acceptance and use of text messaging, the utilization of this technology in healthcare is sure to increase. Widespread adoption of text messaging by healthcare professionals may offer many opportunities to help patients and deliver better care.

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