

Introduction

- **Follow-up** of surgical patients receiving anesthetic placement → **identify procedure-related complications**
- Conventional **telephone calls** → **low rates of successful patient contact** & increased time burden on clinicians
- Prior studies on follow-up with newer technology in the immediate postoperative period
 - **Improved surgical patient response rates** compared to telephone calls [1,2]
 - **Preferred by anesthesia providers** [3]
- No known reports on text message-based, automated follow-up method for patients with continuous peripheral nerve catheters

Here, we present our preliminary experience with an **automated text messaging system**, like the one published by Gessner et al., to provide a consistent regional anesthesia follow-up experience for surgical patients who receive either a **single shot peripheral nerve block or a continuous peripheral nerve catheter** at Massachusetts General Hospital (MGH) Outpatient Surgical Center (OSC) in Waltham, MA.

Methods

- Massachusetts General Brigham (MGB) IRB approved protocol #2022P000642
- Inclusion criteria:
 1. Received regional anesthetic for an ambulatory orthopedic procedure at MGH OSC in Waltham, MA between April 13th, 2022 and December 13th, 2023
 2. English proficiency
 3. Internet access
 4. Ownership of an active email account or mobile phone capable of text messaging
- Locations of regional anesthetic placement: mainly **brachial plexus, adductor canal, sciatic nerve in the popliteal fossa**
- Collection platform: MGB REDCap database
- **SMS** messages containing secure links to identical, secure, online REDCap surveys → sent on postoperative day 1 (**POD1**) and postoperative day 4 (**POD4**)

Regional anesthetic placement



- Reminder text: sent if survey was not completed within first 2 hours
- Data handling, analysis, and plotting: R studio version 2023.06.0, Prism version 9.5.0.
- Patient demographics: compared using student t-test (p-value<0.05 for statistical significance)
- Follow-up response rates: analyzed using chi-squared test of independence with post-hoc pairwise comparisons with Bonferonni correction of the p-value (p-value<0.008 for statistical significance)

Table 1: Patient demographics

		Single shot block	Catheter
Patients (#)		3,638	1,977
Gender	Male	1,189 (32.7%)	911 (46.1%)
	Female	1,168 (32.1%)	652 (33.0%)
	Unknown	1,281 (35.2%)	414 (20.9%)
Age (years)*, p-value = 0.051		45 [17.6]	46 [18.7]
Location # (%)	Lower extremity	2,043 (56.2%)	712 (36.0%)
	Upper extremity	1,477 (40.6%)	1,257 (63.6%)
	Other	118 (3.2%)	8 (0.4%)

*Reported as mean [stdev]

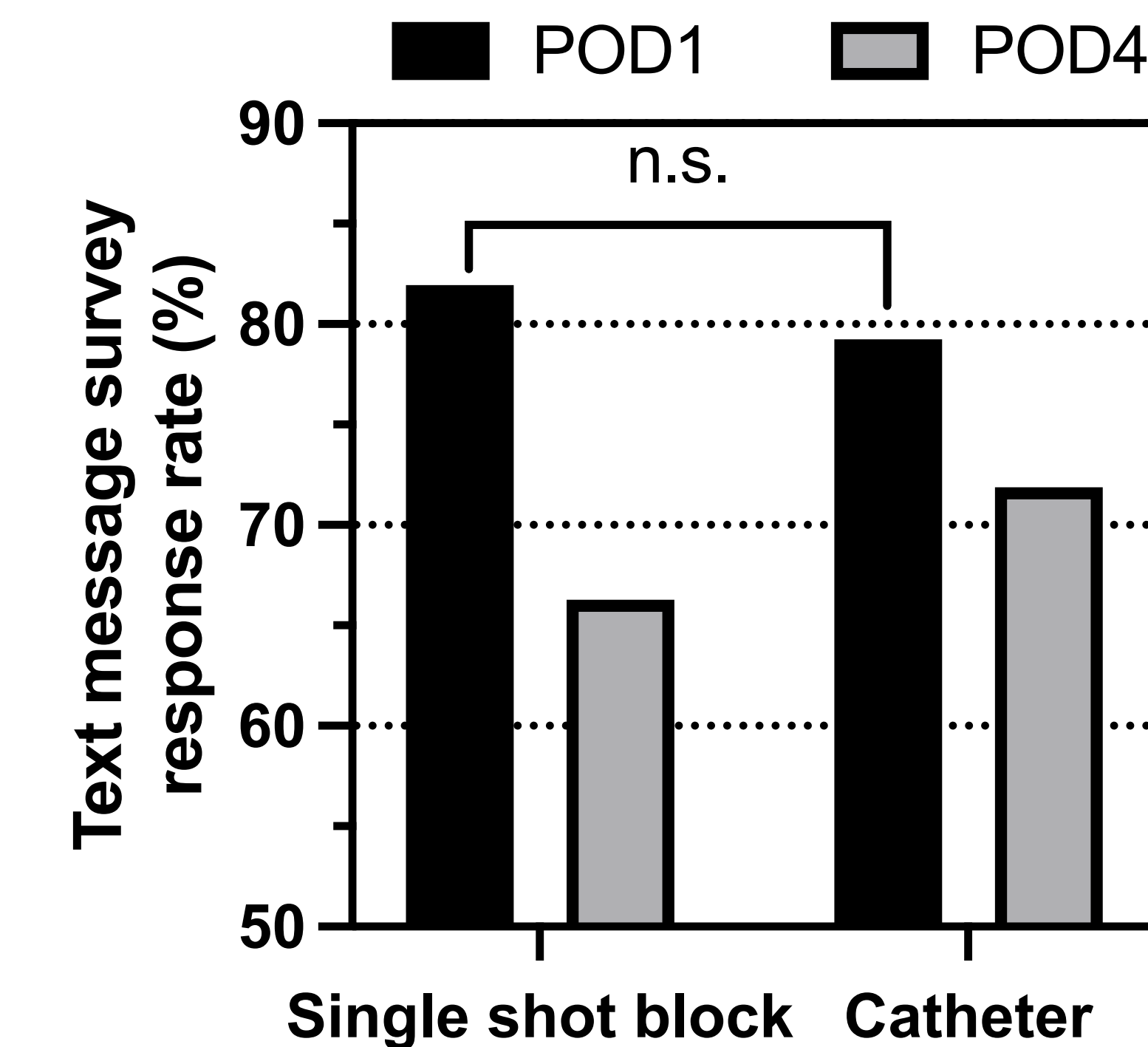
Summary of Findings

- **Positive response rates** to automated text message for **both** single shot peripheral nerve block and continuous peripheral nerve catheter
- Lower POD4 response rate for single shot peripheral nerve block compared to continuous peripheral nerve catheters possibly due to the quick block resolution in patients receiving single shot peripheral nerve block
- Relatively **high response rate** of patients with continuous peripheral nerve **catheter**, supporting the use of automated text messaging system for regional anesthetic follow-up

Results

- **5,615 outpatient orthopedic surgical patients** enrolled
 - **3,638** received single shot peripheral nerve blocks
 - **1,977** received continuous peripheral nerve catheters
- Both groups → **well distributed by gender and regional anesthetic location**
- **Single shot** peripheral nerve block response rate: **81.9%** on **POD1** and **66.3%** on **POD4**
- Continuous peripheral nerve **catheters** response rate: **79.3%** on **POD1** and **71.9%** on **POD4**
- Post-hoc pairwise chi-squared comparison:
 - **All but one group** (POD1 response rate between the two groups) → **statistically different** (Chi-squared range: [18.47-232.1], p-value<0.0001, df=1)

Figure 1: Response rates for automated text message follow-ups in patients who received single shot peripheral nerve blocks or continuous peripheral nerve catheters for outpatient surgery.



Automated text message follow-up on POD1 was similar for patients who received single shot blocks and catheters (p-value = 0.015, with significance with corrected p-value <0.008). All other pairwise comparisons using the Bonferonni p-value correction were statistically different between patients receiving single shot nerve block or catheter nerve block (p-value <0.0001).

n.s. = not statistically significant

Discussion

- Similar results to other published response rates to regional anesthesia follow-up surveys sent more than a day after surgery [1]
- **POD1** response rate (81.4% for single shot peripheral nerve block, 79.3% for continuous peripheral nerve catheter) → **slightly lower than those reported** by Gessner et al. of 91% [2]
 - Difference may be due to our **larger sample size** (5,616 vs. 85 patients)
- **Low POD4 response rate** (66.3%) from patients receiving a **single shot** peripheral nerve block **may be a consequence of block resolution within 24 hours**
 - Most have regained normal neurologic function for more than 72 hours by POD4
 - **Less motivated to respond** regarding their anesthetic on POD4 compared to POD1
- **High POD4 survey response rate** (71.9%) of patients with continuous peripheral nerve catheters likely due to:
 1. Anesthesia provider **reviewed** the text messaging system and the **importance of survey responses** with patients
 2. MGB REDCap automatically extract patient demographic data from electronic medical record, including mobile phone numbers → **reduce data entry error and likelihood of patients not receiving the text messages**
 3. Only two surveys sent to each patient → **limited development of survey fatigue**
 4. Minimal time between cessation of therapy (i.e. catheter removal) and POD4 survey

References

1. Ooi G, Schwenk ES, Torjman MC, Berg K. A randomized trial of manual phone calls versus automated text messages for peripheral nerve block follow-ups. *J Med Syst* 2021;45:7.
2. Gessner D, Hunter OO, Kou A, Mariano ER. Automated text messaging follow-up for patients who receive peripheral nerve blocks. *Reg Anesth Pain Med* 2021;46:524-528.
3. Tan NL, Seston JR. Efficiency and acceptability of an automated electronic system (daycor) compared with a telephone call system, for follow-up of day surgery patients. *Anaesthesia and Intensive Care* 2019;47:242-250.