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## Increasing Perioperative Communication With Automated Mobile Phone Messaging in Total Joint Arthroplasty

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## ABSTRACT

**Background:** Automated mobile phone messaging has not been reported in total joint arthroplasty (TJA). Our purpose was to compare Press Ganey (PG) and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores between TJA patients who did and did not receive perioperative automated mobile phone messages.

**Methods:** Patients were prospectively enrolled and received messages for 1 week prior until 2 weeks after TJA. Message content included reminders, activity, and pain control. Patients answered select PG/HCAHPS and questions regarding their experience with the automated communication platform. Average PG/HCAHPS scores were compared to historical TJA patients in the 3-year window prior (control group) with significance  $P < .05$ .

**Results:** Thirty-seven consecutive patients were approached and 92% ( $n = 34$ ) were enrolled. The experimental group was 47% male, with 80% patients between 51 and 75 years. The experimental ( $n = 30$ ) and control groups ( $n = 26$ ) were similar. Patients receiving messages were more likely to have a good understanding of health responsibilities ( $P = .024$ ) and feel that the care team demonstrated shared decision-making ( $P = .024$ ). Of patients enrolled, 87% felt messages helped them be more prepared for surgery, 100% felt messages kept them better informed, and 97% would participate again.

**Conclusion:** TJA patients who received perioperative communication via automated mobile phone messaging had improved patient satisfaction scores postoperatively. Patients perceived this form of communication was useful and kept them better informed. Automated mobile phone messaging can be an easily integrated, helpful adjunct to surgeons, healthcare systems, and case managers to more effectively communicate with patients undergoing TJA in this era of value-based care.

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Effective communication with patients is critical and has been found to improve patient compliance and facilitate better patient understanding of health needs and management of their own

health [1,2]. There is a continued focus on improving communication between patients as a means of improving patient care. In particular, more frequent communication between surgeons and patients in the perioperative period has potential to improve outcomes postoperatively [3,4].

Mobile phones have revolutionized the way people communicate with one another. Wireless telephones are now widely available and are used by greater than 92% of the US population [5]. The expansion of software-driven automated mobile phone messaging is increasingly used in health care and popularized due to its low cost and ability to be instantaneously delivered at any time, place, or setting [6]. In 2010, the US Department of Health and Human Services identified the potential for mobile phone communication in health care and developed the Text4Health Task Force to encourage and develop health text message initiatives [7].

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**Table 1**  
Automated Mobile Phone Messaging Protocol.

Preoperative Messages		
Preoperative Day	Message	
7	This is a reminder you have surgery scheduled in one week. Continue your exercise program, refrain from smoking and make changes to your home to improve safety, if needed. Please call ***-***-**** (during office hours) or ***-***-**** (after hours) with any questions.	
4	This is a reminder you have surgery scheduled in four days. Make a plan after surgery for 24-hr/day help from family or friends after your hospital stay for assistance around your home, rides to appointments, etc. Please call ***-***-**** (during office hours) or ***-***-**** (after hours) with any final questions.	
2	This is a reminder you have surgery scheduled in two days. Please check skin for any skin breaks, rashes or wounds. Please call ***-***-**** (during office hours) or ***-***-**** (after hours) with any final questions.	
1	This is a reminder that you have surgery scheduled tomorrow. Please refrain from eating after midnight, <8 oz clear fluids up to 2 hrs before surgery, and correctly take your medications as instructed in the preoperative handout. If no one has contacted you by 7 pm, please call us at ***-***-****.	
Postoperative Messages		
Postoperative Day	Message	In Response to "More" Request
1	Today is Day 1 after surgery! There is a large team of providers working hard to care for you and help with your recovery. In general, patients stay in the hospital 1-3 days. Before discharge, goals after surgery include: get out of bed, adequate pain control, able to eat, drink and use the bathroom, walk and climb stairs with an assistive device, and understand precautions to prevent injury. Text MORE for additional info.	Physical therapy will work with you to help you accomplish these goals. Your team is made up of surgeons, nurses, physical therapists and social workers and we will ensure you are taken care of after your joint replacement.
2	Today is Day 2 after surgery. Only take your pain medications as needed. Follow your dressing instructions in your discharge summary. Feel free to call us if you need anything, our goal is to keep you informed! Text MORE for additional tips.	Your goal is to keep moving. Try to get up to a chair for meals, walk to the bathroom, and get out of bed as much as possible. Only take your pain medications if needed, as pain medication can have negative effects on your body, such as constipation, dizziness and upset stomach.
3	Your care team would like you to be as comfortable as possible; however, discomfort is an expected part of recovery after surgery. It is normal to experience many sensations, including sharp or aching pain, tingling, cramping or throbbing. Limit taking pain medication as needed to stay comfortable and active. Text MORE for additional info.	Constipation is common after surgery, often due to anesthesia and pain medication. Drink fluids, eat whole grains and vegetables, and take stool softeners to help bowel function return to normal.
4	Going home from the hospital is an adjustment. Having extra assistance early in recovery is important—don't be afraid to ask for help from family, friends and neighbors. You underwent a big surgery that will help relieve your pain and restore your function, your recovery process continues! Text MORE for additional tips.	The following tips can make your home safer and more comfortable: move obstacles including throw rugs and electrical cords, install a shower seat, get a good chair with a high seat and footstool for elevating your extremity.
5	Staying active the first few days is important and may help alleviate expected discomfort after surgery. Pain medication when needed can help you meet your movement goals. Text MORE for more tips.	Climb stairs with support. Hold on to a railing when possible. Keep moving, your recovery continues!
6	Sleep is often affected after surgery—you may experience discomfort and have difficulty sleeping at night. Get up and move around, elevate your leg or use cold packs to relieve some of the discomfort. Text MORE for additional tips.	Avoid caffeine and alcohol and try to maintain a regular sleep schedule with a goal of obtaining 8 hours of sleep per night to help you feel your best.
7	You are one week from surgery! After a joint replacement, swelling is expected for 3-6 months. Swelling may cause pain and limit motion. Elevate your leg and apply ice to reduce swelling. Text MORE for additional tips.	If swelling occurs, elevate your leg above the level of your heart (place pillows under your calf), and apply ice directly to the surgery site. Continue elevation and ice as needed to decrease swelling and discomfort.
8	Now that you are over a week out from your joint replacement, your pain and activity level will continue to improve. Take time to reflect on the progress you've made! Text MORE for additional info.	We encourage you to continue to increase your activity level while also decreasing your pain medication. It is important after surgery to stay active and eventually stop taking your pain medication.
9	Eat a variety of healthy foods to give you more energy and help your wound heal faster. Fruits, vegetables and plenty of protein will help you on your road to recovery! Text MORE for additional info.	Eating at least 3 meals a day is important. Also, make sure you are drinking plenty of water. Consider treating yourself to a nice dinner, you deserve it!
10	Continuing your physical therapy exercises at this early stage is important to achieve the best result after your new joint replacement. Frequent, short walks are a key to a successful recovery! Text MORE for additional tips.	Make it a goal to walk every hour. Generally speaking, the more you work at exercises the easier they become and the quicker you will return to your normal activities.
11	When you are recovering from surgery, take care of yourself! Take a walk, read a book, watch a movie, listen to music, or meditate. Text MORE for additional tips.	Continue to drink plenty of fluids, but try to limit coffee intake and avoid alcohol. Eat a balanced diet to maintain a healthy weight and avoid putting extra stress on your new joint replacement.
12	Infection after joint replacement is extremely rare. Signs of infection to watch for include drainage from your incision, consistent fevers over 101.3 F, or increasing redness around your surgical incision. Text MORE for additional information.	It will take several weeks for your surgical incision to heal, and up to 3-6 months for the scar to fully mature. Refer to your discharge instructions regarding how to take care of your wound at this early stage.
13	Your recovery process will continue over the next several months. Return to your normal activities is dependent on completing physical therapy exercises and regaining motion, strength and confidence in your operative leg. Text MORE for additional information.	Keep moving! However, keep in mind a balance, as doing too much after surgery may cause pain, swelling, increased skin temperature and tenderness. If these symptoms develop, perform exercises at a lesser intensity or slow down.
14	Congratulations, you are two weeks from surgery! Your first return appointment will be 3-6 weeks after surgery. Continue to monitor your surgical incision and follow exercise program. Please call ***-***-**** (during office hours) or ***-***-**** (after hours) with any questions. Today is the last message. Look forward to a phone call survey regarding the new text messaging system!	

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