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Evaluation of Discharge Telephone Calls Following Total Joint Replacement Surgery

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The average length of stay for patients undergoing total joint replacement surgery at a large teaching hospital is 3 days. This requires a comprehensive discharge education plan. The purpose of this prospective quality improvement project was to evaluate patients' understanding of postoperative care at home, screen for postoperative complications, and identify inconsistencies or gaps in discharge teaching. During a 1-year evaluation period, patients who underwent total joint replacement surgery were interviewed via a telephone call following discharge to home. Patients were asked questions regarding general feeling, pain, wound appearance, edema, anticoagulation, and physical therapy. Concerns reported most frequently included medication side effects, deep vein thrombosis prophylaxis, and the use of assistive devices. The majority of patients reported receiving adequate discharge instructions. This quality improvement project has resulted in improved discharge teaching based on patients' identified needs and early intervention for the prevention of postoperative complications.

Introduction

Surgery is just the beginning for a patient undergoing a total joint replacement (TJR). A complete recovery from TJR surgery extends beyond a patient's hospitalization. Successful healing and prevention of complications are dependent on active patient and family participation in the discharge plan of care. This requires a comprehensive patient and family education plan covering pain management, physical therapy, anticoagulation, and signs and symptoms of postoperative complications. Teaching is especially important as hospital length of stay has decreased and there has been more focus on discharge to home instead of to an extended care facility (Loft, McWilliam, & Ward-Griffin, 2003; Prouty et al., 2006).

Before initiating this quality improvement (QI) project, preoperative and in-hospital teaching was used to help ensure that patients had the information needed to do well following TJR surgery. Patients were invited to attend a patient education class in advance of their operative date. Taught by clinicians from nursing, physical therapy, and case management, the class covers key aspects of TJR care, including the expected in-hospital course and postdischarge needs for anticoagulation, pain management, and physical therapy. A comprehensive binder of printed information reinforces material taught in the class. In the hospital, discharge teaching is part of routine postoperative care and includes instruction and "teach-back" regarding injections of anticoagulants, discussions regarding pain management, instructions on postoperative exercises, and other customized information based on each patient's needs. Despite this attention to education, gaps in patient knowledge remained after discharge. Patients and families continued to voice anxieties and concerns about the complex plan of care.

In 2010, the clinical educator and nurse manager began making postdischarge telephone calls to TJR patients discharged to home to reinforce discharge teaching, screen for complications at home, and allow the patient to ask questions. Telephone calls would not only provide an opportunity for vital nurse–patient collaboration at a time when patients are faced with the challenges of recovery at home, they would also provide important information about the effectiveness of educational programs for these patients.

A prospective QI project was designed to evaluate how a discharge telephone call program can help evaluate a patient's understanding of postoperative care, identify gaps in nurse–patient teaching, and address any other questions that patient and families have once they are at home following surgery.

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Review of the Literature

Discharge telephone calls have been reported in the cardiac, urology, and general medical-surgical populations. Findings from these studies indicate that patients do not realize the importance of discharge education until they are in the home environment (Bostrom, Caldwell, McGuire, & Everson, 1996). Therefore, there is a need for additional reinforcement of teaching after discharge (Davison, Moore, MacMillan, Bisaillon, & Wiens, 2004). Discharge telephone calls provide an opportunity for effective symptom management (Czarnecki, Garwood, & Weisman, 2007) and have been used to evaluate and proactively address complications (Dutkiewicz, 2010). Despite these positive findings, very little has been published to support the use of discharge telephone calls in the TJR population (Ben-Morderchai, Herman, Kerzman, & Irony, 2010).

Preoperative education has been widely used for patients undergoing orthopaedic surgery (Chetty & Ehlers, 2009; Mazaleski, 2011; Prouty et al., 2006; Soever et al., 2010; Spalding, 2003). Overall, the findings have indicated that preoperative education reduces patient anxiety before the surgery by making the unknown more familiar. Despite this evidence, Mazaleski (2011) found that patients and families who attended preoperative educational classes were still anxious about the surgical procedure and were not thinking ahead to the postoperative recovery period. Although the preoperative class provided an important introduction to the plan of care, it was difficult for patients and families to retain and recall postoperative education following discharge. This evidence suggests the need for ongoing educational support.

In-hospital education provides another opportunity to review the discharge plan of care, but numerous factors may interfere with learning. Mazaleski (2011) found that this was not always an ideal time for retention of crucial patient education. In the immediate postoperative period in the hospital, the patients were sleepy, overwhelmed, experiencing pain, and feeling stressed. As a result, these patients did not always retain the discharge education instructions reviewed with them preoperatively or while in the hospital. Costa, Poe, and Lee (2011) found that the hurried process of teaching in the hospital left patients and families with many questions that were not thought about until after the patient was at home. Knowledge gaps are often identified after the patient has arrived home and is faced with the realities of adjusting to the home environment. Many times patients and families do not think of the questions they want to ask until they get home from the hospital. These questions cover various topics. Barksdale and Backer (1998) specifically analyzed the concerns of patients 7 days following total knee replacement (TKR) surgery. Stressors of most concern were pain management and bowel difficulties. These patients did not have sufficient knowledge on these topics and rarely reached out for help. Discharge telephone calls were identified as a way to address these concerns. Similarly, Bostrom et al. (1996) reported that discharge telephone calls provided education at a time when it was most meaningful for medical–surgical patients and their families. Ninety percent (90%) of the patients followed had questions about self-care and recovery at home. Themes identified were diet, bowel function, activity, and rest. In a study of discharge telephone calls made to patients after open heart surgery, healthcare providers' questions focused on patient concerns regarding pain, anxiety, depression, fatigue, sleep disturbances, and activity limitations, along with symptom management strategies (Williamson, 2008). The patients who received these telephone calls reported a decrease in the symptoms described previously, as well as better knowledge of symptom management. In addition to addressing patients' concerns, discharge telephone calls have also been used to promote patient satisfaction. Patients have interpreted these telephone calls as a genuine interest in their welfare and, therefore, are more satisfied with their care (Lee, Wasson, Anderson, Stone, & Gittings, 1998).

Proactively reaching out to the patient at home can be more effective than waiting for the patient to call if there is a problem. Providing contact information for the patient to utilize for questions and concerns does not always work. Barksdale and Backer (1998) found that most patients did not take the initiative to contact their healthcare providers with questions or for clarification regarding their plan of care. Patients who did not receive discharge telephone calls failed to reach out to a nurse, even when given information that a telephone service would be available after discharge. A study by Czarnecki et al. (2007) also demonstrated the reluctance of patients to contact a healthcare provider once they were home. More importantly, findings suggest that patients with the greatest need for support are least likely to initiate contact with their healthcare provider. Costa et al. (2011) reported that patients felt medication questions, for example, could be left unanswered until the doctor's appointment weeks later. Other researchers have focused on the elements of structured education plans and their effects on patient self-care. Elements of key importance included follow-up after surgery (Lee et al., 1998), preoperative teaching (Burt, Caelli, Moore, & Anderson, 2005), effective education during hospital admission (Ben-Morderchai, Herman, Kerzman, & Irony, 2010; Bradke & Brinker, 2011), and inclusion of family members and loved ones in the process (Mazaleski, 2011). Despite evidence that postoperative discharge telephone calls can address patient educational needs at a crucial time, the use of discharge telephone calls to improve outcomes remains understudied in the TJR population. This QI project utilized a postdischarge telephone call to include patients and family members and to reinforce their knowledge of the plan of care.

Methods

Design and Sample

A prospective QI project was performed to explore the effectiveness of postdischarge telephone calls following TJR surgery. This project took place in an academic, tertiary care hospital in Boston, MA. A convenience sample was obtained from all patients admitted to the

orthopaedic unit for TJR surgery of the hip or knee over a 1-year period. Patients who were discharged to a rehabilitation facility were excluded from this project. Two-hundred seventy-four patients (89%) who had undergone TJR surgery received a telephone call after discharge to home with or without services. Of the 274 patients called, 207 patients (79%) were surveyed about their discharge plan of care. One hundred fifteen patients (55%) called had undergone total hip replacement (THR) surgery, while 92 (44%) had undergone TKR surgery.

Demographic information (see Table 1) did not vary greatly between the total knee and THR populations. Fifty-three percent (53%) of the patients who had THRs were female, while 46% were male. Similarly, 60% of the TKRs were female, and 40% were male. Side of replacement surgery was evenly distributed in both the hip and knee replacement populations. The length of stay for both populations ranged between 2 and 8 days, with a mean of 3.8 days for THR and 3.6 days for TKR. A timeframe for the length of time since discharge to postdischarge telephone calls was not standardized; therefore, time from discharge to telephone call ranged from 1 to 9 days. The mean length of time when patients were called was 3.7 days for hip surgery and 3.3 days for knee surgery. If patients were unable to be reached during the initial telephone call but were reached the next day, the day of the initial call was recorded.

Procedure and Data Collection

Patients who were discharged to home following TJR surgery were identified by reviewing the unit's discharge list. Patients received a telephone call from the clinical educator, the nurse manager, or a designated clinical nurse on the orthopaedic unit. A postdischarge telephone call questionnaire was developed by the clinical educator and nurse manager to provide some standardization of questions for each telephone call (see Figure 1). The questions were based on the concerns patients identified in the preoperative teaching class and during hospitalization as well as the concerns of the nurses and orthopaedic surgeons regarding postoperative complications. The questions broadly addressed general feeling, pain control, wound appearance, edema, anticoagulation, and activity. At the completion of the postdischarge telephone call, patients were given an opportunity to ask and clarify any questions or concerns regarding their postoperative care. Following each telephone call, the nurse entered a discharge telephone call note into the patient's electronic medical record. This enabled other members of the orthopaedic team to view the information obtained.

Table 1. Demographics

	THR (n = 148)	TKR (n = 126)
Gender		
Male	68 (46%)	50 (40%)
Female	78 (53%)	76 (60%)
Unspecified	2 (1%)	0 (0%)
Side/site		
Right	75 (51%)	66 (52%)
Left	73 (49%)	60 (48%)
Length of stay (days)		
Range	2–8	2–8
Mean	3.8	3.6
Time called since discharge from hospital (days)		
Range	1–9	1–9
Mean	3.7	3.3

Note. THR = total hip replacement; TKR = total knee replacement.

Findings

The postoperative discharge telephone call consisted of eight questions (see Table 2). The interview was started by asking a broad question, "How have you been feeling since you were discharged from the hospital?" The majority of respondents felt "great" or "good." The findings did not differ significantly between the THR and TKR surgery patients. Details that patients in both groups mentioned as part of the response to this question included reports about pain and trouble sleeping. The THR patients also reported concerns about low blood pressure and bowel problems, whereas TKR patients reported concerns about falling.

Pain was assessed by asking patients to verbally rate their pain on a 0–10 scale, with 10 being the highest level of pain. Any pain score of 4 or more was considered to be indicative of poorly managed pain (Gerbershagen, Rothaug, Kalkman, & Meissner, 2011). Among respondents who did rate their pain, 25% of THR and 28% of TKR patients reported pain as 4 or more on the 10-point scale. However, not all patients rated their pain. The majority of patients were discharged to home with prescriptions for both a narcotic and acetaminophen for pain management. The two medications are recommended together for optimal pain control. However, 19% of patients reported that they were not taking acetaminophen at all. In addition, 18% of patients reported that their pain was worse at night and needed reinforcement of teaching on nighttime pain management. In conversation with the nurse, patients reported being unaware that increased pain at night could be an expected finding postoperatively.

Of the 207 patients who were questioned about experiencing fever or chills, only 3% of patients after knee replacement reported experiencing fever or chills as a one-time occurrence that naturally resolved. Sixteen percent of those who had undergone hip replacement surgery reported erythema or drainage from the incision site. When asked, "Do you have any severe or increased swelling in your leg?" 7% of patients in each group responded "yes." When discussing leg symptoms, 16% of TKR patients reported ecchymosis and were unaware that this is an expected finding postoperatively.

Thirty percent reported using ice therapy to the affected joint, and 14% reported that they were elevating their affected lower extremity. Specific questions

Date of discharge:
Date/time of follow-up phone call:
Surgery type:

☐ Pt. unavailable. Left message to call clinic with questions or concerns. # to clinic provided.

1. Patient's general feeling since discharge:

2. Pain control (0-10 score):

3. Fever/chills: ☐ No ☐ Yes

4. Incision site appearance:
   Erythema: ☐ No ☐ Yes
   Drainage: ☐ No ☐ Yes
   Clean/dry/intact: ☐ No ☐ Yes

5. Severe, increased swelling in leg: ☐ No ☐ Yes

6. Anticoagulation:
   Lovenox: ☐ Difficulty with injections ☐ No difficulty with injections
   Coumadin: Plan in place for blood draws and monitoring: ☐ No ☐ Yes

7. Exercises/Walking

8. Any other questions/concerns

☐ Pt instructed to call clinic for any PCWAS*; ☐ Patient verbalizes understanding

Routine follow-up with surgeon: ☐ No ☐ Yes

Pt requires call-back: ☐ No ☐ Yes

* PCWAS= Persistent, Changing, Worsening, Anxiety provoking Symptoms

FIGURE 1. Total Joint Replacement Discharge Telephone Call Questionnaire.

regarding ice therapy and elevation were not included in the postdischarge telephone call questionnaire; therefore, a higher percentage of patients may have been utilizing these interventions for pain control and management of edema.

Enoxaparin was the main medication used for anticoagulation therapy. No problems were reported with the administration of this medication. However, two patients who were on warfarin for anticoagulation therapy either were taking the wrong dose of this medication or did not have a follow-up plan in place for monitoring. In these instances, the nurse provided additional teaching related to the correct medication dosage and developed a plan for follow-up monitoring of laboratory values.

A single, yes/no question was asked regarding whether patients were walking and doing exercises as prescribed. A "yes" response was recorded for 85% of the patients who had THR, and for 90% of those having TKR. It was realized that the question was too broad and did not enable us to capture needed detail on patients who responded "no." For example, some were not doing exercises as prescribed or were having trouble walking with assistive devices.

At the conclusion of the postdischarge telephone call, patients were asked whether they had additional questions or concerns (see Table 3). Thirty-one percent of patients had questions regarding medication management, including medication side effects, prescription refills, and resuming home medications. Twenty-five percent of patients had questions about bowel problems. It was also found that only 18% of patients reported that they were wearing their compression stockings as instructed. Upon discharge, patients are required to wear compression stockings at all times for 6 weeks postoperatively. Some were not wearing them at all or were taking them off at night. As this was not a standard question, this was only identified if the patient or nurse asked a question about the stockings. As these questions and concerns were not routinely initiated by the nurses making the postoperative telephone calls, it is possible that a greater percentage of patients were having these same issues.

Table 2. Response to Discharge Phone Call Questions

	THR (n = 115 Called/Data)	TKR (n = 92 Called/Data)
How have you been feeling since you were discharged from the hospital?	Great 13%	Great 20%
	Good 73%	Good 58%
	Concerns about bowels, low BP, pain, trouble sleeping, other 10%	Concerns about fall, pain, trouble sleeping 12%
Can you rate your pain on a scale of 0–10?	0–3/10; 29%	0–3/10; 25%
	4–6/10; 19%	4–6/10; 18%
	7–10/10; 6%	7–10/10; 10%
What medication(s) are you taking for pain?	Hydromorphone, 31%	Hydromorphone, 24%
	Oxycodone, 24%	Oxycodone, 26%
	Acetaminophen, 46%	Acetaminophen, 35%
	Other, 4%	Other, 16%
Other pain comments	Pain worse at night, 14%	Pain worse at night, 4%
		Taking less than ordered, 5%
Do you have a fever or chills?	No, 100%	No, 92%
	Yes, 0%	Yes, 3%
Do you have any redness or drainage from your incision?	No, 82%	No, 90%
	Yes, 16%	Yes, 2%
Do you have severe, increased swelling in your leg?	None, 53%	None, 61%
	Decreased, 34%	Decreased, 25%
	Increased, 7%	Increased, 7%
Other factors reported	Ice, 18%	Ice, 12%
	Elevation, 14%	Ecchymosis, 16%
		Blisters, 3%
What medication are you taking to prevent blood clots?	Enoxaparin, 97%	Enoxaparin, 91%
	Warfarin, 2%	Warfarin, 5%
	Enoxaparin bridge to Warfarin, 1%	Enoxaparin bridge to Warfarin, 2%
		Wrong warfarin dose, INR not followed/ drawn 2%
Are you able to do your exercises and walk around without difficulty?	Exercising reported, 85%	Exercising reported, 90%
		CPM concerns, 3%

Note. CPM = continuous passive motion; THR = total hip replacement; TKR = total knee replacement.

Nine percent of THR patients and 23% of TKR patients required follow-up after the initial telephone call (see Table 4). The reasons for follow-up phone calls included clarification regarding pain medications, medication side effects, and questions about resuming preoperative medications. Other concerns identified were related to bowel/bladder regimens, increased drainage from the incision site, leg swelling, signs of wound infection, and temporary change in mental status. In these instances, patients were called back by the same nurse after consulting with the orthopaedic team or by the physician assistant or nurse practitioner. Patients who experienced signs of a wound infection, signs of a deep vein thrombosis, or mental status changes were referred to the orthopaedic team in the clinic or the nearest emergency department for immediate assessment and treatment.

Discussion

Our findings indicate that, despite our efforts to provide TJR discharge education using a binder of standardized discharge instructions, a preoperative class, and reinforcement of this information from the clinical nurse on the day of discharge, gaps in patient teaching remained. Patients had many questions about their home plan of care especially concerning medication management, constipation, and anticoagulation regimen. A number of reasons may have an impact on the patients' and their families' full understanding of the postoperative discharge plan of care. Only a small number of patients were able to attend the preoperative class. Patients and families may have been overwhelmed with the amount of information provided and may not have read through the binder thoroughly. Because of the necessary use of

Date of discharge:
Date/time of follow-up phone call:
Surgery type:

☐ Pt. unavailable. Left message on voicemail to call clinic with questions or concerns. # to clinic provided.

1. Patient's general feeling since discharge: ""

2. Pain control
   0-10 score:
   Medication:
   Hydromorphone ☐ Acetaminophen ☐
   Oxycodone ☐ Other (specify) ☐

3. Fever/chills: No ☐ Yes ☐
   If yes, temp:

4. Incision site appearance
   Erythema: No ☐ Yes ☐
   Drainage: No ☐ Yes ☐
   Clean/dry/intact: No ☐ Yes ☐
   Plan in place for staple removal: No ☐ Yes ☐

5. Severe, increased swelling in leg: No ☐ Yes ☐
   Ice therapy, how often:
   Elevation, how often:
   Compression stockings AAT: No ☐ Yes ☐

6. Anticoagulation:
   Lovenox: Difficulty with injections ☐ No difficulty with injections ☐

   Coumadin:
   Plan in place for blood draws and monitoring: No ☐ Yes ☐

7. Exercises/Walking
   How often doing exercises:
   Using assistive device:

8. Bowel regimen
   Have you moved your bowels: No ☐ Yes ☐
   If not, are you taking: Stool softener ☐
   Laxative ☐

9. Confirmed follow-up appointment:

10. Any other questions/concerns

☐ Pt instructed to call clinic for any PCWAS*; ☐ Patient verbalizes understanding
Routine follow-up with surgeon: No ☐ Yes ☐
Pt requires call-back: No () Yes ()
* PCWAS= Persistent, Changing, Worsening, Anxiety provoking Symptoms

FIGURE 2. Revised Total Joint Replacement Discharge Telephone Call Questionnaire.

narcotics to manage postoperative pain, patients also may not be able to remember the discharge instructions given on the day of discharge. Furthermore, patients may not have family or a significant other present for discharge teaching or to assist them with the at-home plan of care.

Our findings also suggest that the postdischarge telephone call questionnaire needs to be more specific to address patients' and families' discharge concerns. Questions related to pain medication, specifically type and dosage, compliance with compression stockings, bowel movements, and exercise, including ice therapy and performing leg elevation, have been added to the standardized postdischarge telephone call questionnaire. This focused questionnaire (see Figure 2) will enable the nurse making the postdischarge telephone calls to better assess the patient's understanding of their instructions and reinforce any necessary information and teaching.

Postoperative discharge telephone calls were conducted with all TJR patients discharged to home because it was felt that these patients were at an increased risk for complications, and the implementation of telephone follow-up would identify and thereby prevent potential complications. Patients discharged to an extended care facility were purposely excluded as they were receiving close follow-up care by healthcare providers at the facility. Despite the strengths of this QI

Table 3. Thematic Analysis: Questions And Concerns

Overall themes	Medication management, 31% (side effects, prescription refills, resuming home medications)
	Bowel problems/concern, 25%
	Compliance with compression stockings, 18%
Themes specific to THR	Activity, 9%
	Pain, 5%
Themes specific to TKR	Ecchymosis, 9%
	Skin alterations, 3%
	Blood pressure issues, 2%

Note. THR = total hip replacement; TKR = total knee replacement.

project, it is important to note a few limitations. This project was limited to one academic medical center so it may lack generalizability. As noted, there were a number of questions in the postdischarge telephone call questionnaire that were vague and did not specifically address key areas of concern. This limitation has been addressed through the revision of the postoperative discharge questionnaire.

Implications for Nursing Practice

This postoperative discharge telephone call process has important implications for nursing practice. Areas for improvements in nurse–patient/family teaching have been identified. This QI project suggests that it is crucial for nurses to teach the importance of pain management, compression stockings, icing/elevation of surgical extremity, bowel management, recognition of complications, adherence to anticoagulation regimen, and at-home postoperative expectations.

The findings of this QI project indicate that active patient and family participation in the discharge teaching plan is integral to successful recovery at home. Discharge teaching needs to start on postoperative day 1. The teach back method needs to be utilized to assure that the patient and family have a complete understanding of the instructions (Bradke & Brinker, 2011; Malcolm, 2012; Peter, 2011). Clinical nurses need to assess the patient's home support system, and it is essential to include the identified family or support system in all aspects of discharge teaching. That way, family can be actively involved in the at-home plan of care and can help reinforce the postoperative discharge teaching at home. Family can also have the opportunity during the hospitalization to ask questions, identify safety concerns, learn how to assist the patient with activities of daily living, and make necessary changes to the home environment before the patient returns home. Patient postoperative TJR teaching handouts need improvement to target identified themes. The inclusion of patients and families in the development of handouts can also help identify concerns and enhance understandability. Handouts should also be translated into other languages.

Table 4. Patients Requiring Follow-Up

Total hip replacement	Yes, 9%
	No, 91%
	Reasons: Pain medication, bowel/bladder, medication side effects, resuming medications, increased drainage
Total knee replacement	Yes, 23%
	No, 77%
	Reasons: Pain medication, mental status changes, leg swelling, signs and symptoms of incision infection, resuming medications

The authors recommend that in-services and education on identified themes be given to clinical nurses. It is important that clinical nurses are asked to continuously evaluate the discharge teaching process throughout the patients' hospital course and to relay their findings to the nurse manager and clinical educator to further refine the postdischarge telephone call questionnaire. To enhance quality of patient-/family-centered care and consistency in the discharge education process, it is essential for clinical nurses to be mentored in the conduction of postdischarge telephone calls. To enhance education while in the hospital, the authors suggest the consideration of incorporating a discharge class for all TJR patients and families during the hospital admission.

This QI project guided the development of a more comprehensive postdischarge telephone call program for TJR patients, as well as stimulated ideas for redesigning the education program for patients and families. In addition, the results of this QI project will provide the foundation for future research aimed at exploring differences in satisfaction scores for TJR patients discharged to home that receive a postdischarge telephone call compared with those that do not receive a postdischarge telephone call.

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