

Patient/Family Involvement Leads to Successful Outcomes Following Lower Extremity Arthroplasties

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BACKGROUND: Based on feedback from some of our orthopaedic surgeons and data on readmissions, our orthopaedic hospital implemented two initiatives aimed at improving outcomes following lower extremity arthroplasty (LEA). The first was the education for family/significant others of LEA patients and the other the provision of phone-based follow-up and monitoring postdischarge. As such, study objectives were as follows:

- 1. Implement discharge education classes for patients' families/significant others.
- Assess compliance with discharge education through telephone interviews 1 and 5 weeks after discharge.
- 3. Compare pre- and postimplementation findings to assess improvement.

THE APPROACH: A discharge education nurse provided daily education classes to families/significant others of LEA patients; these classes were provided on the morning of the patient's planned discharge. In addition, a discharge education nurse made follow-up phone calls at 1 and 5 weeks postdischarge to ask about compliance to discharge instructions and provide additional support as needed. **METHODS:** The sample comprised 122 total arthroscopy subjects admitted in 2018: 42 had hip replacements, 80 had knee replacements. A nonsignificant Pearson rho showed patients continued to follow instructions. Linear forecasting showed a small positive effect on selected Press Ganey questions.

CONCLUSION: Based on our findings, we conclude that family/significant other discharge education improved compliance with discharge instruction.

Background

Our 54-bed orthopaedic hospital is a freestanding hospital that is a satellite facility of a Magnet-certified community hospital located in the southwestern United States. The types of surgeries performed in the orthopaedic hospital include hip and knee scopes, total knee arthroplasties, total hip arthroplasties, and revisions of hip and knee arthroplasties. We perform approximately 1,400 surgeries on hips and 1,850 surgeries on knees per

year. Most of our lower extremity arthroplasty (LEA) patients are older than 65 years. The average length of stay for both surgeries is 1.3 days.

The hospital contracts with Press Ganey to conduct a postdischarge written survey and to perform postdischarge phone calls to evaluate the patient experience during hospitalization. We became concerned when Press Ganey notified us that LEA patients did not think they had received adequate discharge instructions. In addition, our orthopaedic surgeons told us that LEA patients were not wearing their compression devices or using cold therapy to help with pain management after discharge. We were also seeing a few readmissions for opioid-induced constipation resulting in impaction, something that could have been prevented. On the basis of this information, we realized our LEA patients were not retaining or remembering the postdischarge information provided during preadmission joint camp and the discharge instructions provided to them after surgery. To address this issue, improvements were needed in our discharge education processes.

Literature Review

A literature review revealed that a few articles had been published about the effective discharge education for

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DOI: 10.1097/NOR.000000000000791

LEA patients. Interventions that were found to be successful included the following:

- 1. Understanding patient goals following joint arthroplasty (Van Citters et al., 2014).
- 2. Providing discharge teaching to both patients and their families/significant others (Darcy et al., 2014; Marcus-Aiyeku et al., 2015).
- 3. Monitoring patient postdischarge (Marcus-Aiyeku et al., 2015).
- 4. Following up with patients by phone after discharge (Brennan & Parsons, 2017; Darcy et al., 2014).
- 5. Providing targeted, patient-centered written and verbal communication (Cano-Plans et al., 2018; Marcus-Aiyeku et al., 2015).

Theoretical Framework

Meleis' middle-range Transitions Theory served as the theoretical framework for this project. There are two parts to this theory. The first part is an intervention to facilitate the transition, promote well-being, and overcome any consequences of change. Family and significant others are important in this part of the transition. The second, most important part, is to help the patient and family/significant others understand the transition process. Triggers of transitions can be developmental processes, a result of a change from health to illness, situational issues, or organizational changes.

Individuals respond to transitions differently (Transitions Theory, n.d.). Applying theoretical concepts to LEA patients showed the following:

- 1. LEA can be a triggering event in a healthillness transition.
- 2. Nursing care is needed prior to, during, and after that transition.
- 3. The major nursing goals during transition are to prepare the patient and family/significant others for the transition and to provide care that enhances well-being and quality of life.
- 4. The expected outcome for LEA patients is healthy adjustment following surgery.

Patient Education Prior to This Study

Prior to this study, we provided targeted, patientcentered written and verbal communication to LEA patients as recommended by Cano-Plans et al. (2018) and Marcus-Aiyeku et al. (2015). LEA patients who were part of our interactive, online chart portal were invited to a 2-hour joint camp taught by an orthopaedic clinical nurse leader and a physical therapist. Unfortunately, some of the LEA patients were not part of the portal, so they did not have portal access and remained unaware of the educational opportunity. Content covered in Joint Camp is summarized in Table 1. Each patient attending was given a written summary in the form of a booklet to take home with them.

On admission, all LEA patients were asked to name the goal they were most looking forward to doing after

TABLE 1. JOINT CAMP INFORMATION

- 1. Getting ready for surgery at home
- 2. Preoperative testing
- 3. The admission process
- 4. Preoperative holding processes
- 5. Recovery information
 - a. Waking up in the postanesthesia care unit
 - b. Use of the dual-function ice and compression machine
 - c. Diet after surgery
 - d. Pain assessment and management
 - e. Medications and side effects
 - f. Intravenous fluids and antibiotics
 - g. Incision care
 - h. Bowel and bladder management
 - i. Nutrition
 - j. Walking
 - k. Leg exercises to promote circulations and prevent thrombosis
 - I. Use of incentive spirometry
- 6. Discharge information
 - a. Diet and exercise
 - b. Incision care
 - c. Physical therapy and ambulation
 - d. Admission to a rehabilitation hospital or skilled nursing unit if needed
 - e. Home health if needed
 - f. Adapting your home to meet postoperative needs

their arthroplasty, as recommended by Van Citters et al. (2014). Their goal was documented in their charts. Every healthcare professional interacting with the patient mentioned that goal to the patient. It served as a way for staff to bond with patients while also reminding them that their goal was attainable.

After surgery, LEA patients received discharge teaching from the primary nurses. Their families/significant others may or may not have been present for this teaching. Patients were given a written discharge instruction packet to take home with them; the packet was included with their discharge paperwork.

Identified Gaps

Family members are essential to a patient's recovery after surgery and become caregivers following the discharge. However, they often feel unprepared to care for postsurgical patients at home. Involving family members in patient care and teaching them about care activities during hospitalization can reduce the incidence of complications and subsequent readmissions, improving outcomes (Estes et al., 2019).

Following a review of the education we provided to LEA patients, we realized that we were missing two evidence-based interventions described in the literature. First, we did not have a formal process for educating families/significant others of our LEA patients. Also, we were not monitoring patients postdischarge or doing follow-up phone calls to them. Both of those interventions were recommended in articles by Marcus-Aiyeku et al.

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(2015) and Darcy et al. (2014). We thought we should add both of those interventions to our existing program.

Purpose

Our goal was to improve our discharge education program by including families/significant others in discharge education and monitoring LEA patients with follow-up phone calls to assess compliance with the education and answer any questions they had about their care. Darcy et al. (2014) found that postoperative telephone calls facilitated collaboration between discharge nurses and patients and family members at a time when there may be little support about how to handle postoperative care for LEA patients. They also believed the postoperative phone calls provided important information about the effectiveness of discharge education and allowed discharge nurses to provide additional education if needed. The study objectives were to:

- 1. Implement discharge education classes for patients' families/significant others.
- 2. Assess compliance with discharge education through telephone interviews 1 and 5 weeks after discharge.

3. Compare pre- and postimplementation findings to assess improvement.

Methods

SAMPLE

During the first 6 months of 2018, once we instituted the discharge education class, all family members or significant others of LEA arthroplasty patients were invited to participate in this study. Those who consented were enrolled in the study, resulting in a sample size of 122 subjects (42 hip and 80 knee arthroplasties). For family members and significant others to be eligible to participate in the study, LEA arthroplasty patients had to be:

- Living independently in a home or apartment;
- Sharing the domicile with family or significant others who could be included in the new family/ significant other discharge education program;
- Cognitively and physically able to comply with postoperative therapies;
- Fluent in English; and
- Able to agree to participate in the study.

M.I.L.E.S.	Discharge Education Needed	Content Covered						
M = medications	Anticoagulants: Aspirin, rivaroxaban (Xarelto), or warfarin (Coumadin) to be taken for 4–6 weeks is the commonly ordered anticoagulant. Pain: Opioid and nonopioid pain medications are recommended at discharge. Use of Q-pumps (this content was deleted when their use was discontinued during data collection).	 Drugs use, action, and side effects/adverse reactions Signs and symptoms of overt and occult bleeding Report any signs and symptoms of overt and occult bleeding to the physician Pain medication prescriptions are given either prior to surgery or at discharge Opioid and nonopioid medications used for pain relief Common side effects/adverse reactions of pain medications Information about Q-pumps during the time they were prescribed for patients 						
I = issues to remember, highlighting positioning	Positioning of the affected leg fol- lowing surgery	 Positioning information for hip arthroplasty patients Positioning information for knee arthroplasty patients, particularly not to place a pillow under their knees 						
L = legs	Use of the compression and cold therapy using the machine that is sent home with them Patients are sent home with a walker	 Wear the inflatable compression sleeves when in a chair or in bed for the first 2 weeks following discharge The sleeves and machine prevent venous thromboembolism in legs The cold (ice) component of the machine is an adjunct to pain medications to help with pain management Use the walker for a minimum of 2 weeks after discharge Slowly change from the walker to a cane or to independent walking 						
E = elimination	Bowel problems from opioid pain medications Bladder problem from the urinary catheter inserted prior to surgery	 Constipation may be due to opioid pain medications and the temporary decrease in mobility Take a stool softener daily to prevent constipation Mild burning sensation when urinating is common following catheter removal and should quickly resolve Contact the physician if burning increases in intensity and other symptoms such as frequency and urgency occur, as these are symptoms of a urinary tract infection 						
S = surgical site dressing care	Dressing care	 Dressings are waterproof, but soaking the dressing in water during a tub bath is prohibited Wrap the dressing in plastic wrap prior to a shower to add a second layer of protection. Families/significant others are encouraged to help subjects wrap the dressing in plastic wrap Leave the dressing on the surgical site until the 2-week postoperative appointment with the surgeon Do not let a home health nurse remove the dressing 						

TABLE 2. M.I.L.E.S. DISCHARGE EDUCATION CONTENT FOR FAMILIES/SIGNIFICANT OTHERS

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FIGURE 1. M.I.L.E.S. magnet. The color version of this figure is available in the online issue at https://journals.lww.com/ orthopaedicnursing.

INTERVENTION

During the last quarter of 2017, the orthopaedic surgeons began giving patients information about the discharge education class during their preoperative visit. Once patients were admitted for surgery, admission nurses reminded the patients/families significant others that a discharge education class would be offered to them prior to the patient's discharge.

The 30-minute discharge education class for families/ significant others was provided in addition to our educational content given to patients by the nurses caring for them postoperatively. Classes were given at 9 a.m. on the day of discharge. All family members/significant others were invited to attend.

A pneumonic, M.I.L.E.S. (medications, issues, legs, elimination, and site dressing), was used to organize and convey essential content for the family/significant other education classes. The information provided during this class was general postdischarge instruction and was not individualized for specific patients. All LEA arthroplasty patients were also given this general information plus individualized instruction during postoperative discharge teaching by the nurses caring for them. Table 2 contains the general educational content given to family members and significant others.

To reinforce the discharge instructions, a M.I.L.E.S. magnet (see Figure 1) was designed. It was printed on card stock paper, and magnetic strips were attached to the back. Subjects were asked to place it on their refrigerator door or any other metal surface that was frequently used in their home. It served as a daily reminder of important discharge instructions. All subjects were contacted at 1 and 5 weeks postdischarge by the discharge education nurse to assess their compliance with discharge teaching and answer any questions that they had.

INSTRUMENTS

The 12-question M.I.L.E.S Compliance Survey (see Table 3) was developed and guided follow-up phone calls to subjects at 1 and 5 weeks postdischarge. The discharge education nurse asked the subjects questions during each phone call and recorded answers using a yes/no format. The tool assessed medication compliance, use of hip or knee precautions, use of compression and ice as indicated, bowel and bladder issues, and care of the surgical site dressing.

ETHICS

The health system institutional review board (IRB) reviewed the project and deemed that it could be conducted as a minimal risk quality improvement project. Consequently, following IRB review, all LEA patients who met the criteria were asked to participate in the study. Family members were given a written letter explaining the study.

The program was developed, tested, and evaluated during the last quarter of 2017. Formal program implementation began in January 2018. Data collection occurred throughout the first 6 months of 2018. A total of 127 patients/families or significant others dyads were asked to participate in the program. Five dyads declined to participate, resulting in a sample of 122 families/significant others who served as the convenience sample for the study.

At the time of discharge, the discharge education nurse collected essential information from subjects to facilitate follow-up phone calls. The subject's individual identifier was documented on an appointment form. Subjects were given specific dates and approximate times when the discharge education nurse would contact them so that subjects would know when they would be contacted. The discharge education nurse asked both patients and their family members/significant others helping them to participate in the phone call. If the family members/significant others could not participate, the discharge education nurse spoke with the patient and offered to speak with the family members/significant others on a separate phone call if needed.

Each subject was assigned an individual identifier that began with K for knee and H for hip, followed by sequential numbering. Subjects' phone numbers, time of day to call, and dates for the 1- and 5-week phone calls were documented. This information was kept in a locked cabinet because it linked subjects' names and subject numbers. After the 5-week follow-up phone calls, this information was shredded to maintain subject confidentiality.

The M.I.L.E.S Compliance Survey guided questioning during each follow-up phone call to subjects. Answers to survey questions were documented during each phone call.

During the data collection period, the orthopaedic team stopped the use of the Q-ball as a pain intervention approach. Once that happened, the discharge education nurse omitted that question on the M.I.L.E.S. survey.

Results

In total, 122 dyads of LEA arthroplasty subjects and their family members/significant others who met the

TABLE 3. M.I.L.E.S. COMPLIANCE SURVEY					
Medications	Have You:	1-Week Follow-Up	5-Week Follow-Up		
	Been taking your blood thinner?				
	Been taking your oral pain medication?				
	Had your Q-ball removed?				
Issues	Have you:	1-Week Follow-Up	5-Week Follow-Up		
Нір	Been following your hip precautions?				
Knee	Remembered not to put a pillow under your knee?				
Legs	Have you been:	1-Week Follow-Up	5-Week Follow-Up		
	Wearing your black inflatable compression sleeves as directed?				
	Using the ice component of your machine?				
	Using your walker?				
Elimination	Are you:	1-Week Follow-Up	5-Week Follow-Up		
	Taking a stool softener?				
	Having burning on urination once your urinary catheter had been removed?				
Site dressing	Are you:	1-Week Follow-Up	5-Week Follow-Up		
	Protecting your dressing when you shower?				
	Going to keep your dressing on until your doctor removes it?				

eligibility criteria served as the convenience sample for this study. Forty-two subjects had hip arthroplasties and 80 subjects had knee arthroplasties.

M.I.L.E.S. SURVEY

Table 4 contains the results from the yes/no questions on the M.I.L.E.S Compliance Survey. The results showed that subjects and their families/significant others were following their discharge instructions. All subjects were ordered anticoagulants at discharge and stated that they were taking them at 1 week postdischarge. At 5 weeks postdischarge, 11.5% (n = 14) stated that they were no longer required to take anticoagulants. At 1 week postdischarge, 4.9% (n = 6) reported that they were no longer taking narcotic medications for pain. That number increased to 11.5% at 5 weeks. The 116 subjects who continued to take narcotic analgesics at 5 weeks stated that they were only using them at bedtime.

All patients who had had hip arthroplasties (n = 42) were following hip precautions at 1 and 5 weeks. Only hip arthroplasty patients should have been using a pillow under their knees. However, 68% of subjects (n = 83) were putting a pillow under their knee at 1 week, indicating that some knee arthroplasty subjects were also using a pillow under their knees. At 5 weeks, that percentage dropped to 60.7% (n = 74). At both data collection times, subjects who had knee arthroplasties were reminded to elevate the entire lower leg, not just the knee.

Most subjects (n = 115; 94.3%) were wearing a compression sleeve on the affected extremity at 1 week. None of the subjects continued to wear it at 5 weeks. There was also a significant decrease in use of a walker between 1 week (n = 111; 91%) and 5 weeks (n = 3; 2.5%). Subjects who had stopped using a walker were using a cane for independent walking.

Subjects were sent home with a machine providing compression that offered an ice component for pain relief (V-pulse by Breg). The use of the ice component was optional because our physicians had found that it did not help some patients. Many study subjects (n = 87; 71.3%) were using the ice component of the compression machine to help with pain control at 1 week. However, only 4.1% (n = 5) continued the use ice at 5 weeks.

Any postoperative bowel and bladder issues resolved at 5 weeks. Six subjects stated they had urinary burning after catheter removal during the 1-week phone call but that had resolved at the 5-week phone call. Those with urinary burning at 1 week were asked to call their physicians so that a urinary tract infection could be ruled out. Most subjects (n = 107; 87.7%) were taking a stool softener for potential opioid-induced constipation at 1 week, but that number dropped to 13 (10.7%) at 5 weeks.

All subjects who had dressings at 1 week (n = 119; 97.5%) kept them covered while showering and had not removed their dressings until the first postoperative visit where the physician removed it. There were no postoperative wound infections requiring hospitalization in any subjects.

PRESS GANEY SCORES

There was no way to separate out total Press Ganey scores for the study subjects. So, we compared the results of all patients in 2017 (before starting the discharge education class for families/significant other) with all patients in 2018 (after that discharge education class was implemented). Because the hospital is a specialized facility that admits and operates on patients with knee or hip problems, we felt confident that the Press Ganey scores reflected our subjects.

We calculated the 2017 and 2018 percentages for the top rating for four questions (see Table 5). When asked how patients felt about their readiness for discharge, responses for "very good" increased by 9.1% in 2018. Responses to three questions that asked whether they

TABLE 4. COMPARISON OF M.I.L.E.S. SURVEY ANSWERS AT WEEK 1 AND WEEK 5						
Questions	Week 1	Week 5				
Have you been taking you blood thinner?	Yes 100%	Yes 88.5%				
	No/NA 0%	No/NA 1.5%				
Have you been taking your oral pain medication?	Yes 95.1%	Yes 80.3%				
	No/NA 4.9%	No/NA 19.7%				
Have you had your Q-ball removed?	No/NA 100%	No/NA 100%				
If you had a hip replacement, have you been following hip precautions?	Yes 100%	Yes 34.4%				
	No/NA 0%	No/NA 65.6%				
Have you been putting a pillow under your knee?	Yes 68%	Yes 60.7%				
	No/NA 32%	No/NA 9.3%				
Have you been wearing your compression sleeve?	Yes 94.3%	Yes 0%				
	No/NA 5.7%	No/NA 100%				
Have you been using the ice component of your machine?	Yes 71.3%	Yes 4.1%				
	No/NA 28.7%	No/NA 95.4%				
Have you been using your walker?	Yes 91.0%	Yes 3.3%				
	No/NA 9.0%	No/NA 96.7%				
Have you been taking your stool softener?	Yes 87.7%	Yes 14.8%				
	No/NA12.39%	No/NA 85.2%				
Have you had any urinary burning after your urinary catheter was removed?	Yes 4.9%	Yes 0%				
	No/NA 95.1%	No/NA 100%				
Have you been protecting your dressing in the shower?	Yes 97.5%	Yes 0%				
	No/NA 2.5%	No/NA 100%				
Have you kept your dressing on until your doctor removes it?	Yes 97.5%	Yes 0%				
	No/NA 2.5%	No/NA 100%				
Note. $NA = not applicable.$						

agreed with the statements also showed increases between 2017 and 2018. The percentage of those who chose "strongly agree" to the question asking whether their preferences were taken into account increased 7.2% in 2018. When asked whether they understood how to manage their health, percentages increased by 4.48% when both the years were compared. And, when asked whether they understood the purpose of the medications prescribed at discharge, percentages increased 8.67% in 2018.

QUALITATIVE FEEDBACK

The discharge education nurse reported that subjects said the M.I.L.E.S. magnet helped them remember the important information they needed to review each day. Most of them said they had placed it on their refrigerators

in their kitchens and kept it there until after the 5-week phone call when the discharge nurse told them they could remove it. The orthopaedic surgeons reported that their patients were wearing their compression sleeves as recommended and using the ice component if they found it helpful.

Discussion

We believe adding an additional discharge education class for families/significant others had a positive effect on our patients' recoveries because of improved understanding of postoperative care. Our finding is supported by other research recommending that discharge education should be provided to both patients and families/ significant others. In their 2019 article, Estes et al.

TABLE 5. PRESS GANEY SCORES FOR VERY GOOD OR STRONGLY AGREE RESPONSES FOR 2017 AND 2018

	Very Good		Strongly Agree	
Questions	2017	2018	2017	2018
To what extent did you feel ready for discharge?	77.1%	86.2%		
Your preferences were taken into account.			64.29%	71.49%
You understood how to manage your health.			69%	74.62%
You understood the purpose of prescribed medication.			73.48%	82.15%

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(2019) actively involved family caregivers in postoperative care of patients in the hospital. They found that educating families about patient care needs decreased complications, unplanned readmissions, and length of hospital stay. Patients, family caregivers, and healthcare providers were also more satisfied with the hospital experience. Marcus-Aiveku et al. (2015) discovered that there was a significant lack of education to family caregivers about care following discharge, causing unnecessary anxiety in patients and family caregivers. They instituted a discharge education class for patients and family members during their hospitalization to decrease that anxiety. Darcy et al. (2014) instituted postdischarge phone calls to patients who had LEAs to address patients and family caregivers postdischarge concerns. They stated that patient and family caregiver participation in discharge education during hospitalization was necessary for a successful recovery at home.

Before implementing family/significant other discharge education, readmissions for fecal impaction due to opioid-induced constipation had occasionally occurred. The exact number could not be obtained unfortunately, due to the hospital's coding system for readmission diagnoses. There have been no readmissions for fecal impaction since we changed our discharge education process to include taking a daily stool softener.

We also noticed during follow-up phone calls that family members/significant others remembered the instructions and helped with the subjects' postdischarge care. They felt comfortable assisting patients with basic care activities, such as covering the dressing during showers, applying the compression sleeves, positioning the patient's affected extremities both in and out of bed, and assisting the patient with ambulation. They felt they were able to recognize potential complications and notify the physician if necessary. Giving them the M.I.L.E.S magnet seemed to prevent the information from being lost in the numerous forms given to LEA arthroplasty patients at discharge.

We have presented the study findings at system meetings. We hope that our process will be incorporated throughout our hospital system so that other system hospitals can improve their LEA arthroplasty discharge education.

This study is not without limitations. Measurement was based on patient report, which could have been influenced by them giving socially acceptable responses. The measurement tool needs revision. The question about Q-balls should be removed and closed-ended questions replaced with open-ended questions. Additional space is needed to address any concerns the discharge education nurse identified and any teaching to be revised and questions modified so that they are open-ended needed to be reinforced during the phone call. The sample size was small and was collected at one facility. We were unable to separate out Press Ganey scores for participating subjects, so we were forced to compare data obtained from all patients admitted in 2017 and 2018. Further research is warranted because LEA surgeries will increase as the population ages.

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