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IMPROVING NURSE
KNOWLEDGE AND ATTITUDES OF EARLY MOBILIZATION
OF THE POSTOPERATIVE PATIENT

by

Laurie Chatterley

A Major Paper Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

in

The School of Nursing

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Abstract

Mobilization plays an important role in the outcomes of postoperative patients. Early mobilization as an intervention is the most significant general nursing measure in the prevention of complications. Current research demonstrates a decrease in complication rates, reported pain and length of stay when early ambulation is initiated. Despite this evidence, early mobilization as a best practice standard is implemented inconsistently on the women's health unit of a community hospital. The purpose of this project was to improve nurses' knowledge and attitudes of early mobilization of postoperative patients. The quality improvement project utilized a pre-survey, educational intervention, post-survey design. Twenty-five nurses (52%) participated in the project. The educational intervention integrated knowledge obtained from the review of literature in the form of a 15 minute Power Point presentation. Pre/post-survey included knowledge-based questions and opinion-based questions. Overall, post-survey scores increased by 16.8% and knowledge were improved when compared to the pre-survey. Nurses' opinion of the importance of mobilization improved from pre-survey to post-survey ($\bar{x}=8$ pre; $\bar{x}=9.44$ post). Time and patient's pain were noted as barriers to early mobilization. Minimal change in nurses' opinion of these barriers was noted from pre-survey to post-survey (time: $\bar{x}=5.76$ pre; $\bar{x}=5.68$ post) (pain: $\bar{x}=5.56$ pre; $\bar{x}=5.08$ post). The nurses' ability to communicate and document mobilization showed the largest improvement from pre-survey to post-survey ($\bar{x}=5.2$ pre; $\bar{x}=7.24$ post). The educational in-services were successful in improving the nurses' knowledge and attitude of early mobilization of the postoperative patient.

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Improving Nurse Knowledge and Attitudes of Early

Mobilization of the Postoperative Patient

Background/Statement of the Problem

Early mobilization of the post-operative patient is associated with reduction in incidence of post-operative complications. “Early ambulation is the most significant general nursing measure to prevent postoperative complications” (Lewis, Dirksen, Heitkemper, & Bucher, 2014, p. 356). The action of ambulation is associated with increased muscle tone, stimulation of circulation leading to prevention of venous stasis and venous thromboembolism (VTE), increased vital capacity and the maintenance of respiratory function and improved gastrointestinal and genitourinary function.

As of 2010, approximately 50 million inpatient operations were performed annually in the United States, accounting for a large portion of the country’s health care resources (Centers for Disease Control and Prevention, 2010). In the age of pay for performance mandates by insurance companies and Medicare, low complication rates, decreased lengths of stay and improved patient satisfaction have associated monetary reimbursements to hospitals. These monetary incentives tie patients’ physiologic state of wellness to the financial health of healthcare organizations.

Early postoperative ambulation has been well studied and described. A study by Dr. Canavaro in 1946 changed the practice of routine ambulation beginning on postoperative days 10-14 to early ambulation on postoperative day 1. This early ambulation program resulted in a reduction of postoperative complications by approximately 50%, a more rapid return to normal bodily functions, and improved patient morale (Canavaro, 1946). Current research of early mobilization and the postoperative patient continues to demonstrate decrease in complication rates, reported pain and length

of stay when early ambulation is initiated (Dube, Kshirsagar, & Durgawale, 2013; Havey, Herriman, & O'Brien, 2013; Pearse, Caldwell, Lockwood, & Holland, 2007). Evidence in the literature supports early mobilization of the postoperative patient as best practice, though it remains a missed point of care by nurses. The MISSCARE Survey of 1,098 nurses in four U.S. hospitals revealed that of 21 elements of nursing care surveyed, ambulation had the highest percentage noted by nurses of being missed, at 86.6% (Kalisch, Terzioglu, & Duygula, 2012).

The intervention of ambulation is typically prompted by physician orders or structured protocols. Early ambulation as a best practice standard is implemented inconsistently in postoperative patients on the women's health unit of a community hospital. The current mobility protocol at this community hospital provides direction for medical and critical care patients but defers to individual post-surgical orders when managing postoperative patients. The postoperative order sets for the patients being cared for on the women's care unit vary somewhat and some leave when to initiate postoperative ambulation and frequency open to interpretation. Ambulation orders are present on some but not all of the postoperative order sets and some orders do not indicate timing and frequency. Chart reviews demonstrated that many postoperative patients on this unit are remaining in bed longer than expected after surgery, increasing potential risk from the negative effects of bedrest.

The purpose of this quality improvement project was to improve nurse knowledge and attitudes of early mobilization of the postoperative patient.

Next, the review of literature will be presented.

Literature Review

A comprehensive online search was completed utilizing the search engines CINAHL, Ovid, MEDLINE and PubMed. Searches were limited to 2006 to 2016, with exception of a historical search from 1946. Key words used included early mobilization, early ambulation, postoperative, barriers, nursing care, missed care, complications of immobility, bedrest and mobility protocols.

Complications of Bedrest

Evolution has resulted in the human body functioning optimally in the upright position (Knight, Nigam, & Jones, 2009a). The average adult will spend 16 hours upright and eight to nine hours in a supine position for rest. Since the time of Hippocrates, prolonged periods of bedrest have been prescribed and believed to assist recuperation and promote healing (Knight et al.). In the 1940s, standard periods of bedrest included three weeks after hernia surgery and two weeks after childbirth (Corcoran, 1991). Bedrest and immobilization can often benefit an acutely affected part of the body by conserving metabolic resources for healing and recovery, but when prolonged, bedrest can adversely affect the rest of the body through inhibition of the beneficial effects of physical activity (Brower, 2009).

A meta-analysis of 39 randomized controlled trials (Allen, Glasziou, & Del Mar, 1999) in the literature examined the benefits and/or harmful effects of bedrest in 15 different medical conditions and procedures. Within the 39 trials there were two major therapeutic uses for bedrest: prophylactic treatment after a medical procedure and primary treatment. Pooled analysis was not attempted due to the variations of approach and bedrest application. Twenty-four studies evaluated the prophylactic effects of bedrest after a medical procedure. No outcomes were significantly better with bedrest

and 26 outcomes were worse, nine significantly. Fifteen studies investigated bedrest as the primary treatment. Similarly, no outcomes were significantly better, 25 outcomes were worse, nine significantly. “Overall, there was no evidence that bedrest has any significant beneficial effect when used as a treatment or when used after surgery. Indeed, in some disorders it seems to be harmful.” (Allen et al., 1999, p. 1231).

Cardiovascular risks. Potential cardiovascular complications of immobilization include decrease cardiac reserve, orthostatic hypotension and venous thromboembolism (Dittmer & Teasell, 1993). It is the natural tendency for blood to rush downward to the lower limbs by gravity when a person moves from a supine position to a standing position. In the healthy, mobile patient it is the responsibility of valves in the veins and lymphatic vessels, and baroreceptors in the aortic arch and carotid sinuses, to maintain blood pressure to minimize the risk of orthostatic hypotension. In the immobile, bedridden patient these mechanisms are impeded by reduced blood volume, blunting of baroreceptor reflexes, decreased venous return and pump ineffectiveness from cardiac deconditioning (Knight et al., 2009a).

According to Knight, Nigam and Jones (2009a), the increased risk of thromboembolism is a result of the hematological insults of the immobile patient. These hematological insults are the pathophysiologic mechanisms of Virchow’s triad and etiology of thromboembolism formation. Virchow’s triad refer to three factors, venous stasis, hypercoagulability and blood vessel damage, that when present increase the risk of developing a thrombus. Immobility of the skeletal muscles causes blood flow to become sluggish, leading to pooling and venous stasis. Pooling in the lower extremities decreases the amount of clotting factors that are cleared by the liver and therefore increasing

viscosity of the blood. Continuous weight of the supine body on the vessels causes mechanical damage to the endothelium, exposing collagen beneath. Platelets then stick to the collagen rich tissue prompting the formation of blood clots (Knight et al.).

A prospective cohort study by Sweetland et al. (2009) followed 947,454 middle-aged women and examined the magnitude of thromboembolism risk postoperatively. Over a six-year period (1996-2001), there were 239,614 admissions for surgery and 5419 admissions for thromboembolism. Compared with not having surgery, women were 70 times more likely to be admitted for thromboembolism following an inpatient operation. Thromboembolism has been shown to be a risk factor of both prolonged bed rest and postoperative status separately (Sweetland et al.).

Respiratory system risks. Bedrest has direct impact on the respiratory system (Teasell & Dittmer, 1993). The supine patient is unable to sufficiently contract ventilator muscles required for full inspiration which leads to decrease in lung volume. Seventy-eight percent of the tidal volume is achieved through ribcage movement. When supine, ribcage movement is restricted, decreasing tidal volume by an estimated thirty-two percent (Knight et al., 2009a). Mucous lining the smaller air passages of the bronchial tree pool when patients are immobile. The pooling of mucous block airways leading to atelectasis and pneumonia (Teasell & Dittmer).

Endocrine and renal system risks. Altered endocrine and renal functions are consequences of bedrest and immobilization. A decrease in basal metabolic rate can be seen in as little as 10 hours of immobility and can progressively drop metabolism by 6.9% after 10-24 hours of bedrest (Knight, Nigam, & Jones, 2009b). Insulin resistance and glucose intolerance is often an overlooked complication of bedrest. Studies have

shown, in healthy subjects confined to bedrest, an increase in fasting blood glucose and blood insulin levels as compared to those with normal physical activity (Brower, 2009). The renal pelvis drains by gravity. Bedrest accounts for the loss of gravitational emptying, which can lead to renal calculi formation and infection (Knight et al., 2009b).

Gastrointestinal system risks. Bedrest negatively affects the gastrointestinal system and the musculoskeletal system. Anorexia and constipation are results of immobilization. Disuse, decreased colonic peristalsis, and increased water absorption all lead to constipation. Opioid analgesics used for postoperative pain further slow gut motility compounding the problem of constipation (Knight et al., 2009b). Decrease in muscle strength, loss of endurance and bone demineralization all result from immobility (Knight, Nigam, & Jones, 2009c).

Psychological risks. Immobilization and bedrest have negative psychological effects on patients. Increased levels of stress and anxiety are partly due to loss of personal control. Lack of control can result from the loss of activities that are normally taken for granted, such as walking to the bathroom and the ability to stretch one's legs. A patient's loss of control over their environment has been linked to increased release of stress hormones, such as corticosteroids. Stress has been shown to directly influence physiologic changes (Knight et al., 2009a). The concept of "learned helplessness" from prolonged bedrest can perpetuate the sick role (Corcoran, 1991).

Benefits of Early Postoperative Mobilization

Current nursing textbooks advocate, "early ambulation is the most significant general nursing measure to prevent postoperative complications" (Lewis et al, 2014). Early mobilization of the postoperative patient reduces the catabolic effects of surgery on

skeletal muscle, improves pulmonary functions and circulation through increased oxygen delivery to tissues and reduces the risk of venous thromboembolism. Postoperative ambulation promotes the return of gut function assisting in the prevention of postoperative ileus (Saleh & Majumbar, 2012). Decrease in pain and length of stay in hospitals and increase in functional ability and patient satisfaction are results of early mobilization of the postoperative patient (Kalisch, Lee, & Dabney, 2013).

A 2013 review of 36 studies that examined the outcomes of mobilizing hospitalized adults, 16 of which sampled postoperative patients, revealed benefits in not only physical outcomes but also emotional and social well-being (Kalisch et al., 2013). Studies were divided for evaluation into main outcome categories: physical; psychological; social; and organizational. Twenty-four studies reviewed reported positive physical outcomes: less delirium; less pain; less urinary tract infections; less pneumonia; more ventilator-free days; and improved physical function. Three studies reported positive psychological outcomes, such as less depression, anxiety and symptoms of distress and increased comfort. Seven studies reported improved quality of life and improved independence when evaluating social outcomes. Decreased length of stay, decreased mortality, and less cost was seen in 12 studies evaluating organizational outcomes (Kalisch et al.).

Thromboembolism Prevention. The Surgical Care Improvement Project, initiated in 2005, applied evidence-based principles focused on the prevention of surgical infections, thromboprophylaxis and cardiac complications (Kehlet & Wilmore, 2008). Measures identified to prevent thromboembolism include pharmaceutical and mechanical

interventions. Early mobilization is one part of the mechanical interventions to prevent thromboembolism.

In 2009, Chandrasekaran, Ariaretnam, Tsung, and Dickison investigated the effects of early mobilization on the incidence of DVT in patients undergoing total knee replacements. A sample of 100 patients was divided evenly into an experimental group and a control group. The experimental group patients were mobilized within 24 hours of surgery compared to the control group that began mobilization on postoperative day two. Mobilization was defined by sitting out of bed or walking for at least 15-30 minutes twice a day. Results demonstrated a statistically significant reduction ($p=0.03$) in thromboembolism complications in the experimental group (Chandrasekaran et al.).

Pearse et al. (2007), using the same population type, studied control and experimental groups of 195 patients. In the experimental group of 97 surgical patients, ambulation began within 24 hours after surgery. For the control group of 98 surgical patients, ambulation began on postoperative day two. The results showed a statistically significant ($p < 0.001$) lower incidence of DVTs in the experimental group versus the control group (1% vs. 27.6%).

A quasi-experimental study (Garcia-Guerro, et al., 2010) investigated the occurrence of DVT in 47 consecutive patients receiving pacemaker implantation. Patients mobilization was categorized as high ($n=29$), moderate ($n=6$), and low ($n=12$). Asymptomatic DVT was diagnosed in three (6.4%) patients, all of whom had low mobility during the implantation period. The authors found that those with moderate to high amounts of mobility did not experience a DVT and those with low amounts of mobility did develop a DVT.

Postoperative pneumonia. Anesthetics, oxygen concentration, surgical positioning and comorbidities all increase the risk of atelectasis and postoperative pneumonia (Canet et al., 2010). Mobilization promotes movement of secretions and stimulates coughing and deep breathing and assists in full expansion of the lungs, minimizing hypoventilation in the postoperative patient (Pusey-Reid, 2014).

A 2003 retrospective cohort study of 131 postoperative hip fracture patients tested the hypothesis that time to ambulation impacts frequency of postoperative complications (Kamel, Iqbal, Mogallapu, Maas, & Hoffman). Surgical time to ambulation was recorded. The mean time from writing an order to ambulation of a patient was significantly less when the patient was cared for on orthopedic surgery service versus a general surgery service (1.8 +/-1 versus 2.5 +/- 2, $p<0.05$). Time to ambulation was an independent predictor of the development of pneumonia (1.5 OR [odds ratio]/day; $p<0.001$).

In 2010, Karube, Ozawa, Watanbe, & Aiba evaluated the number of complications experienced by 181 older chronic subdural hematoma patients who underwent burr-hole surgery. The early mobilization (EM) group began walking on day of surgery as compared to the control group that had delayed ambulation (DM). Postoperative complications, such as pneumonia and urinary tract infection, were observed in 24 (26.4%) in the DM group and 11 (12.1%) in the EM group ($p < 0.05$). The results suggest that early mobility after one burr-hole surgery prevents postoperative complications.

In 2007, a retrospective observational study of 86 postoperative thoracic patients evaluated the safety of early mobilization and complication rates associated with early

mobilization (Kaneda et al.). Patients were evaluated for respiratory complications, deep venous thrombosis (DVT) and alterations in skin integrity. Early mobilization of 36 patients in the experimental group, who ambulated four hours postoperatively, were compared to 50 patients in the control group that ambulated on postoperative day 1. Results demonstrated that not only was it safe to ambulate this patient population four hours postoperatively, there were no reported bacterial or interstitial pneumonia, DVT or skin ulcerations.

Bowel function. Postoperative patients are at increased risk for ileus formation related to decreased peristalsis. A review of literature evaluated the effects of mobility in abdominal surgery patients. The primary outcome was reported time to return of bowel function. In a study of 28 postoperative colon resection patients in an accelerated recovery program with increased mobilization, an earlier return of bowel function was noted (Basse et al., 2002). The accelerated recovery program was multimodal involving anesthesia, surgical technique and nursing protocols. Nursing protocols postoperatively greatly influenced mobilization through implementation of required physical activity and patient education of daily expectations to meet mobilization goals. Total time out of bed during the first postoperative week was recorded. The interventional group's total time out of bed was significantly ($p < 0.01$) longer than that of the control group, 87 hours versus 61 hours. Return of bowel function was determined by postoperative defecation. The mean postoperative day of defecation was day 1 for the interventional group compared to day 4 in the control group.

Similarly, Raue and colleagues (2004) researched whether a "Fast-Track" multimodal rehabilitation program improved outcomes after laparoscopic

sigmoidectomy. Fifty-two consecutive patients were placed into either the intervention group receiving a multimodal rehabilitation program or the control group receiving standard care determined by the postoperative unit on which they were placed. The fast track multimodal group was out of bed on day 0 of surgery and for extended lengths beginning on day 1 postoperatively. Fast track patients returned to a regular diet and had bowel movements 1 day earlier than the control group.

A quasi-experimental study of 80 women (Kaur, Kaur, & Sikka, 2015) evaluated the effectiveness of early ambulation of post-cesarean delivery women. The experimental and control groups were divided evenly. Early ambulation was defined as six hours postoperatively and was noted to improve return of bowel function as evidenced by earlier passing of flatus and shorten initiation of oral fluids. Bowel function as evident by the first passing of flatus was improved within the experimental group (62.5% versus 10%) within one hour of ambulation. The start of oral intake within one hour of ambulation occurred in 80% of of the experimental group compared to only 4% in the control group.

Pain. Postoperative pain control is an essential part of the care of the surgical patient. Pain control in the surgical patient has close ties with clinical outcomes and patient well-being. The advantages of effective postoperative pain management include patient comfort and satisfaction, earlier mobilization, fewer pulmonary and cardiac complications, a reduced risk of deep vein thrombosis, and reduced cost of care (Ramsey, 2000). While effective pain management may assist in earlier mobilization, studies have shown that early mobilization aids in pain management and the reduction in the use of opioids to maintain that same level of comfort.

In a study of 50 women after cesarean delivery, ambulation was evaluated with pain intensity and analgesia requirements (Karakaya et al., 2012). The experimental group received physiotherapy with early mobilization. Incisional pain was rated and showed consistency in pain levels between both groups. A significant difference was noted in the amount of analgesia required. The amount of analgesic/anti-inflammatory medications needed in addition to the standard pain control delivered was 5.04 ± 0.96 in the study group compared to 5.79 ± 0.78 in the control group ($t = -3.034$, $p = 0.004$). The experimental group needed less analgesia for pain control.

Similarly in 2015, Kaur et al. studied the effectiveness of early ambulation in the recovery of post-cesarean mothers. Eighty mothers were enrolled by enumerative sampling technique and divided evenly into control and experimental groups. The experimental group's mean time to ambulation was six hours compared to 14 hours in the control group. Both groups showed a decrease in pain after ambulation. Paired t -test results indicated that in the experimental group pain was reduced from 6.5 ± 1.82 to 5.3 ± 1.34 where in the control group pain was reduced from 7.25 ± 1.94 to 6.00 ± 1.31 after ambulation. Further independent t -test revealed that the difference in pain scores before ambulation was not significant ($p = 0.07$), but after ambulation the difference was noted to be statistically significant ($p = 0.038$). The experimental group reported significantly less pain than the control group. The control group required more analgesia than the experimental group. Seventy percent of patients in the control group required 2-3 injections of analgesic after ambulation. In comparison, 27.5% of patients in the experimental group required 2-3 injections of analgesic after ambulation. These differences were statistically significant ($p < 0.001$).

Psychosocial Effects. Inpatient mobilization has been shown to positively influence quality of life. Patient satisfaction, independence, ability to care for one's self and comfort are all variables that encompass quality of life (Dube et al, 2013; Kaur et al, 2015; Rezaei-Adaryani, Ahmadi, & Asghari-Jafarabadi, 2009).

Rezaei-Adaryani and colleagues (2009) investigated the effect early ambulation after cardiac catheterization (CC) on comfort and patient satisfaction. A single blind randomized study of 70 participants was evenly divided into control and experimental groups. The control group received routine positioning, including 10–24 hours of bed rest in supine position with the affected leg immobilized. The experimental group was positioned in the supine position with the head of bed (HOB) 15 degrees elevated during the first and second hours and in the supine position with HOB 30 degrees elevated during the third hour. While the patients in the experimental group were in supine position in the first three hours, they were given a thin supportive pillow under one side of their body, either left or right, from the shoulder to the gluteus area. The place of the pillow was changed every half hour to the right or the left side of the body. In the fourth hour patients were in the supine position with HOB 45 degrees elevated, respectively in the right and left lateral positions with HOB 15 degrees elevated in the fifth and sixth hours and in Fowler's position in the seventh hour. After the seventh hour, the patients were allowed to be out of bed and sit in the bedside chair for 10–15 min and then to walk around and undertake self-care activities. Comfort and satisfaction scores were collected at time increments of immediately following, one, three, six and eight hours after CC. Comfort and satisfaction scores were not significantly different at the immediate (9 ± 2 , 8 ± 2 , $p=0.76$; 9 ± 2 , 9 ± 2 , $p=0.44$ respectively) and 1 hour (8 ± 2 , 8 ± 3 , $p=0.95$; 8 ± 2 ,

8±3, $p=0.46$ respectively) post CC. This correlates with the timing prior to the mobilization of the experimental group. The significant difference in comfort and satisfaction between the control and experimental groups began to be seen at three hours post CC (5±2, 8±2, $p<0.0001$; 6±2, 8±2, $p<0.0001$ respectively) and continued through till eight hours post CC (4±3, 10±1, $p<0.001$; 4±3, 10±1, $p<0.0001$ respectively). The results demonstrate that patients in the experimental group, who received a new way of positioning accompanied by ambulation after CC, experienced significantly less discomfort and more satisfaction (Rezaei-Adaryani et al.).

In a study of 500 post-cesarean mothers, Dube et al. (2013) examined the effects of early ambulation were seen in improved activity levels. The tool for data collection was an activity rating scale consisting of eight selected activities in relation to self-care and newborn care and scored the mothers as having poor, good or excellent post cesarean activity. Non-participatory observations were carried out and recorded daily. On post cesarean day one, little difference was noted in the activity scores in both the early ambulation and control group, both with >99% receiving poor post cesarean activity scores on breastfeeding, elimination, sitting, walking, self-care and care of the newborn. By day three, only 3% of the early ambulation group scored poor compared to 94.4% of the control group. On day five, 96.8% of the early ambulation group scored excellent versus only 8.4% in the control group. Breastfeeding, elimination, sitting, walking, self-care and care of the newborn were all performed significantly better in the early ambulation group than of the control group (Dube et al.).

Research by Kaur et al. (2015) showed that early ambulation post-cesarean improved comfort, breastfeeding and holding of the newborn independently. The study

population was 80 mothers that had undergone cesarean section with spinal anesthesia. The subjects were allotted into experiment (40 mothers) and control (40 mothers) groups through block randomization. Eighty percent of mothers in the early ambulation group were able to breastfeed and hold their baby's independently at six hours post cesarean versus 17.5% in the control group. These differences were statistically significant ($p < 0.001$). Early ambulation was effective in improving outcomes for post cesarean mothers (Kaur et al).

Early mobilization and decreased length of stay. National healthcare expenditures have risen from 1.9 trillion dollars (15.9% of the GDP) in 2005 to 3 trillion dollars in 2015 (17.5% of the GDP) (National Center for Health Statistics, 2016). Decreasing length of stay has become a hot topic associated with the attempt to reduce hospital costs, though some studies have shown that the cost saving associated with the reduction of length of stay is greatly exaggerated. Costs incurred on the day of discharge account for approximately 3% of admission cost (Carey, 2000; Taheri, Butz, & Greenfield, 2000). Reduction in length of stay continues to promote positive outcomes. Decreased length of stay minimizes the opportunity for hospital acquired infections as well as the functional decline associated with hospitalization.

Early mobilization of the postoperative patient has been shown to decrease length of stay. In a 2010 retrospective study (Morris, Benetti, Marro, & Koch Rosenthal, 2010), data were collected through chart review on the benefits of early mobilization in patients undergoing postoperative joint replacement patients before and after clinical practice guidelines were implemented. The practice guidelines changed the practice of

mobilization from postoperative day one to day of surgery. A reduction in length of hospital stays from 4.3 to 2.8 days was achieved.

Early ambulation in the abdominal surgery population has been well researched. Sixty-four post laparotomy and intestinal resection patients were randomly placed into either the experimental group or the control group (Delaney et al., 2003). The following data were collected at time of discharge and 10 days and 30 days after surgery: time of discharge from hospital; complication and readmission rates; pain level; quality of life; and patient satisfaction scores. The experimental group that was encouraged to walk and sit out of bed had decreased length of stay after surgery than the control group (5.4 vs. 7.1 days; $P = 0.02$). Patients younger than 70 years old had greater benefit with a decrease in length of stays (5 vs. 7.1 days; $P = 0.01$). There was no difference between control group and experimental group for other studied aspects of the impact of ambulation such as readmission or complication rates, pain score, quality of life after surgery, or overall satisfaction with the hospital stay.

Raue and colleagues (2004) evaluated the effects of a multimodal “fast track” rehabilitation program on measurable outcomes. The “fast track” program involved the use of epidural anesthesia, early oral feeding and enforced mobilization. Fifty-two consecutive patients undergoing laparoscopic sigmoidectomy were treated with standardized perioperative care (29 patients) or “fast track” multimodal rehabilitation program (23 patients). Admission to one of two surgical wards signified which treatment regimen was received. Improved outcomes were noted using a controlled prospective evaluation of a “fast track” multimodal rehabilitation program. Fast-track patients were discharged on postoperative day 4 (LOS range = 3-6), and standard-care patients on

postoperative day 7 (LOS range = 4-14). It was concluded that the fast-track multimodal program significantly ($p < 0.001$) decreased the postoperative length of stay (Raue et al.)

Barriers to Early Mobilization

Barriers to postoperative mobilization have been identified and can be categorized into prominent themes: nurse and institutional barriers and patient barriers. An extensive study at 10 acute care hospitals and 3,143 registered nurses investigated the amount of and reasons for nursing care being missed (Kalisch, Tschannen, Lee & Friese, 2011). Missed nursing care is an error of omission, defined as “any aspect of required patient care that is omitted (either in part or whole) or significantly delayed” (2011, p. 291). The MISSCARE Survey was the instrument used to assess nurse staff perceptions of and reasons for missed care. Ambulation of patients three times a day or as ordered was the most frequently reported component of missed care, with 76% of nurses reporting this care point being always, frequently or occasionally missed. Inadequate labor resources and communication were most often cited as perceived barriers, 93.1% and 81.7% respectively. The top reason across the 10 hospitals within the theme of labor resources was an unexpected rise in volume and/or acuity. Less consistency was noted regarding communication across the 10 hospitals. Unbalanced patient assignments, inadequate handoff and breakdown of communications between care-providers were frequently reported barriers (Kalisch et al.).

Dafoe, Stiller and Chapman (2015) researched staff perceptions of the barriers to mobilizing patients in the intensive care unit. A prospective survey consisting of an introduction section, sample descriptive data and the main body that comprised a series of closed statements regarding the perceived barriers to early mobilization was

administered. Responses required the use of a 10cm visual analogue scale (VAS). Institutional-related barriers to mobilization that were surveyed were imminent ward transfer, time constraints, risk to injury, equipment appropriateness, equipment availability, staff willingness, staff expertise and staff availability. The most frequently perceived barriers by staff were time constraints and staff availability, with a mean of 7 out of 10 on the VAS. Poor interdisciplinary communication, lack of leadership championing the importance of mobilization, and no clear recommendations regarding mobilization were items frequently noted as other barriers that prevented early mobilization (Dafoe et al.).

Authors of a qualitative study (McLeod et al., 2015), as part of a broader protocol implementation project, investigated the barriers to implementing an Enhanced Recovery After Surgery (ERAS) program. The ERAS program includes evidence-based standardized guidelines with the goal of improving patient outcomes and minimizing complications. Early mobilization is a component of ERAS programs. Interviews were conducted of 19 general surgeons, 18 anesthesiologists and 18 nurses. All participants were supportive of a standardized ERAS protocol based on best evidence. Lack of manpower, poor communication and resistance to change was noted by most as barriers. Discipline-specific responses of nurses revealed man-power issues as the largest barrier to early ambulation. Surgeons and anesthesiologists stated a change in nursing culture would be required to overcome barriers.

Hoyer and colleagues (2015) assessed barriers to mobilization across two hospital settings. A cross-sectional, self-administered survey of 120 nurses determined the highest perceived barrier as “increasing mobilization of my inpatients will be more work

for nurses” (p. 309). This concern may be valid when thinking of the intended task, but nurses involved in mobility initiatives at the studied hospital reported reduced workload related to an increase in patient independence. Communication and patient resistance were further items that ranked high among nurses’ perceived barriers.

A study (Leibermann et al., 2013) of 146 randomized gynecologic surgical patients was designed to assess whether enhanced encouragement of ambulation impacted the number of pedometer-recorded steps taken in the 24 hours prior to discharge when compared to usual postoperative care. A 10-question patient survey was conducted to assess patients’ perception of obstacles to ambulation. Twelve percent (n =8) of both the intervention and control groups recorded no pedometer steps before discharge. No statistical difference in the number of pedometer steps recorded was seen between the control and intervention group. It was concluded that lack of structure related to how ambulation encouragement was given was the cause of these insignificant results. However, valuable information was gathered through the 10-question patient survey, which was completed by 80% (n = 65) of the participants. The most common barriers to ambulation for patients were urinary catheters (38.5%), intravenous poles (28%) and pain (12.5%). There was no statistical difference between the intervention and control group in patients’ perception of barriers. Overcoming these easily modifiable patient-identified barriers have the potential to improve postoperative ambulation (Leibermann et al.).

Nurses’ Barriers to Change in Practice

The healthcare environment is constantly changing, requiring nurses to adapt to the changing demands to remain current and to deliver evidence-based, quality nursing

care. Changes in practice involve the acceptance of new knowledge, the understanding of research and successful implementation strategies (Abrahamson, Fox, & Doebbeling, 2012; Brown, Wickline, Ecoff, & Glaser, 2009). It is vital for the facilitators of change to take into account nurses' attitudes and perception of barriers when attempting to implement a change in practice. In a review of the research focusing on nurses' barriers to learning, adoptions of evidence-based practice, and utilization of research, four major themes have been extrapolated: time constraints; workplace culture; application of knowledge; and ability to access literature (Abrahamson et al., 2012; Koehn & Lehman, 2008; Majid et al., 2011).

A descriptive, cross-sectional survey design study (Koehn & Lehman, 2008), using self-report questionnaires, was used to investigate nurses' perceptions, attitudes and knowledge associated with evidence-based practice and barriers that prevent adoption of evidence-based change. The survey, Clinical Effectiveness and Evidence-Based Practice Questionnaire, was developed and psychometrically validated by Upton and Upton (2006). This is a 24-item, Likert scale questionnaire to measure nurses' perceptions of their practice, attitudes and knowledge/skills of evidence-based practice (Upton & Upton). Four hundred and twenty-two (40.9%) questionnaires were returned for evaluation. Six options were offered regarding the question of barriers to evidence-based practice. Nurses were informed they could select more than one answer and/or offer comments. Five hundred eighty-six responses were recorded for the six options. The distribution of responses were: there are no barriers (12.1%; n = 71); no time (39.4%; n =231); too costly (11.4%; n=67); no knowledge/limited knowledge of research (23.4%; n=137); no nurse with research knowledge in my practice setting (9%; n=53); no interest

by nursing leader (4.7%; n=28). Comments (n=21) regarding barriers were consistent with the “no time” option, noting time/staffing issues/heavy workload as factors impeding the implementation of evidence-based practice. Majid et al. (2011) explored the attitudes, knowledge of and barriers to the adoption of evidence-based practice via a survey questionnaire. A 70.8% response rate yielded 1,486 completed questionnaires. The questionnaire was divided into three sections: demographics; attitudes toward and knowledge of evidence-based practice including motivators and barriers to implementing evidence-based practice; and where nurses obtained their information for patient care and clinical decision-making. A set of five statements was used to investigate beliefs and attitudes toward evidence-based practice. It noted that 64.3% (n =956) of nurses either “disagreed” or “strongly disagreed” with the statement that nurses preferred traditional methods over new patient care approaches, which suggested that nurses were open to new health care approaches. Nine statements were used to capture barriers that prevented the adoption of evidence-based practice. A high percentage of nurses responded with “no opinion”, though more than 53% of nurses “agreed” or “strongly agreed” that a major barrier to the adoption of evidence-based practice was the lack of time at work to search and read research articles. More than 48.1% (n =715) of the nurses reported that the inability to understand statistical terms, inadequate understanding of the technical aspect of research articles, and difficulty judging the quality of the research were barriers to the attainment of knowledge (Majid et al.).

Abrahamson, Fox and Doebbeling’s study (2012) of 575 nurses analyzed free-text responses to two open ended questions to learn about nurses’ perceptions of the motivational factors and barriers to the use of clinical practice guidelines. Analyses of

the responses were categorized in themes and subcategories of internal and external factors. Internal factors were those that existed within the nurse such as knowledge, attitudes, and motivation or lack thereof regarding practice change. External factors were those that exist outside the realm of the nurse such as work environment, the organization or the guideline itself. External barriers were identified by 91% (n =523) of the nurses compared to internal barriers that were identified by only 10% (n =58) of the nurses. The common internal barrier noted was “information overload”, meaning that the inability to understand the high level of the information impedes the use with in clinical practice. Multiple external barriers were noted. Time, staffing, and workload comprised the most frequently noted barriers at 44% (n=251) of sampled responses. Education and training (25%), communication (22%), and administration support (15%) rounded out the top barriers that impeded nurses’ ability to use guidelines in clinical practice.

Overcoming Barriers to Change-Implementation Strategies

The implementation of evidence-based practice is a key component in quality nursing care. Hospitals are pursuing Magnet designation in response to the public’s demand for excellence. The American Nurses Credentialing Center (ANCC) describes Magnet designation as the ultimate seal of nursing quality. A major criterion for receiving Magnet designation is nurses’ active involvement in research and evidence-based practice (ANCC, 2016).

Implementation strategies have been researched to overcome the status quo and resistance to change. Implementations of new concepts of nursing practice are presented in multiple ways. Nurses receive instruction on these new concepts for practice through physician orders, order sets for specific patient populations, written guidelines, protocols

or simply implied understanding under best practice standards. It is crucial for implementation strategies to incorporate a means to facilitate concept into practice (Brown et al., 2009).

A 2009 descriptive, cross sectional research study by Brown et al. reported nurses' attitudes, knowledge and practices and the relation of the perceived barriers and facilitators to evidence based practice. A convenience sample of 458 nurses employed at an academic medical center responded to two reliable and valid questionnaires: the BARRIERS to research utilization scale and Evidence-Based Practice Questionnaire. Participants were offered, in addition to the questionnaires, free text options. Only 19% (n =87) of participants added free text responses regarding barriers on the BARRIERS to evidence-based practice survey. Ninety-nine percent (453/458) of participants added free text responses to open ended items asking for facilitators on the Evidence-Based Practice questionnaire. These responses ranged in length from sentences to several paragraphs. Learning environment, building culture, availability and understanding of evidence became evident as themes in the narrative responses. Nurses' indicated that increasing their knowledge and skills in reading and translating research would better enable them to incorporate evidence-based practice in to their care. Improving the learning environment through mentorship would facilitate change. One respondent said:

An onsite CNS... nurses in general don't have time on the unit to read many research articles and then interpret the data, but I believe in a CNS actually comes around, explains the research and how it can be implemented into practice, we could be more willing to give it a try (p. 377).

Building an organizational culture that recognized and rewards autonomy in nursing practice was seen in the responses “environment open to change, multidisciplinary environment of mutual respect”, “make it a policy then educate and enforce”, “environment of open communication and exchange of ideas” (Brown et al., 2009, p. 377). The need for research and desire for positive implementation of current concepts was evident within the responses. The crucial element was the availability and simplicity of the evidence. Research has to be usable through availability and understandability. “Translate research into real everyday language” (p. 377).

Abrahamson et al. (2012) surveyed nurses’ perceptions of facilitators and barriers to the use of clinical practice guidelines through free text responses to two open-ended questions. The first survey question solicited the nurses’ perceptions of the barriers to the use of clinical practice guidelines and the second question queried the nurses’ perception of the facilitators to the use of clinical practice guidelines. Responses were categorized into themes answering the question “What are the facilitators to clinical practice guideline use?” Of 973 nurses, 575 (59%) completed the survey for qualitative analysis. The themes were categorized as knowledge based, organization based or attitude based. Education/orientation/training (n=212) and communication (n=153), both knowledge based themes, were most frequently noted at 37% and 27% respectively as motivators to the use of clinical practice guidelines. The organization-based theme of time/staffing/workload (n=120) was noted 21% of the time as a facilitator to the use of clinical practice guidelines. Administrative support (n=108) was the one attitude based theme that ranked within the top frequently noted themes at 19% as a facilitator of clinical guideline use.

McLeod and colleagues (2015) set out to develop and implement an Enhanced Recovery After Surgery (ERAS) clinical practice guideline (CPG) at 15 academic hospitals. A needs assessment noted that there was only 75% compliance in only two of the 18 recommendations of the ERAS protocols. The framework of the Knowledge-to-Action Cycle guided the strategy to develop and implement the CPG. Nineteen surgeons, 18 anesthesiologists and 18 nurses participated in semi-structured interviews to assess potential barriers and facilitators to the implementation of the ERAS guidelines. Interviewees were supportive of implementing standardized protocols. The need to identify respected champions or leaders to provide education and encourage inter-professional collaboration and communication was cited as a key strategy point for successful implementation. Information identified in the interviews was used to develop a multipronged implementation strategy that spanned all disciplines. The main components included: identifying nurse, surgeon and anesthesiologist champions at each site; communication of best practices through electronic updates, presentations, and workshops; hospital administration support; and involvement of the patient population through patient education. Early results, through audits and feedback, have shown positive outcomes of the developed implementation strategies and ERAS protocols (McLeod et al.).

In summary, research supports early mobilization of the postoperative patient. The positive impact on functional outcomes and decrease in complications are evident throughout the literature. While barriers exist, supporting nurses through the availability of educational programs that promote the benefits of early mobilization may increase prioritization of early mobilization in nursing care of post-operative patients.

Next, the theoretical frameworks guiding this quality improvement project will be described.

Theoretical Frameworks

Lewin's Change Theory and the Logic Model are theoretical models that were used to guide the development of this quality improvement project.

Lewin's Change Theory

Lewin's Change Theory (1951) is a method within his field theory providing a basis for the process of planned change. Planned change of an individual's or group's behavior involves a psychological process of unlearning known behaviors and relearning new behaviors in an attempt to restructure thoughts, attitudes and actions. This process can bring about feelings of anxiety and uncertainty. Lewin's Change Theory, when executed in its entirety, has been shown to achieve lasting and effective change (McEwen & Wills, 2011).

The fundamental concepts of Lewin's theories of planned change are field and force (McEwen & Wills, 2011). Lewin defined field as an individual's "life space". The concept of field is that an individual's behavior is related to the merging of personal characteristics and to the social situation in which one finds himself/herself. This can be described as a person's motives, needs, and ideals. Force is defined as a directional focus and strength. Lewin explains that change involves two types of forces, driving forces and restraining forces. When driving forces and restraining forces are at equilibrium then no change can occur (Lewin, 1951).

Driving forces are those that tend to initiate change. They encourage movement toward a goal or outcome. In contrast, a restraining force blocks the progress toward a goal and impedes change. In the process of planned change, the driving and restraining forces should be identified as a possible means of predicting whether the change will be

successful (Lewin, 1951). A force-field analysis can be carried out to evaluate the driving and restraining forces for a planned change as per Lewin's model.

Lewin (1951) recognizes that for change to be successful three phases must occur; unfreezing, movement, and refreezing. The unfreezing phase involves individuals or groups to recognize the need to change the status quo. It is necessary for the change agents in this phase to communicate in a way that provides direction and an understanding of the importance of the proposed change (McEwen & Wills, 2011). This phase is where planning, strategizing, and empowering the staff occurs (Kassean & Jagoo, 2005). Only when the strength of the driving forces is greater than that of the restraining forces can movement begin.

Movement, the second phase of Lewin's planned change process is the implementation point. The change agent must understand that this requires time and should be accomplished gradually. Even when staff are unfrozen and ready for change the initial steps can cause uncertainty and stress (McEwen & Wills, 2011). Refreezing is the last phase in Lewin's planned change process. It is within refreezing that stabilization occurs. If the change is successful, it becomes the new status quo (McEwen & Wills, 2011). Evaluation of the goal at different time frames allows for a better view of the refreezing phase. Initially change is expected to meet resistance. As the new change becomes habit refreezing has been successful (Kassean & Jagoo, 2005).

Lewin's Change Theory was used assess need, implement and evaluate an educational program for the purpose of increasing the knowledge and attitude of early mobilization of the postoperative patient. Lewin's Change Theory was selected as the

model to develop and implement an educational program of the benefits of early mobilization of the postoperative patient to the nurses of the inpatient women's care unit.

Logic Model

The Logic Model (University of Wisconsin-Extension Program Development and Evaluation., n.d.) is “a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan, and the changes or results you hope to achieve” (W.K. Kellogg Foundation, 2004, p. 1). The Logic Model, illustrated in Figure 1 on the next page, integrates planning, implementation and evaluation of a program through the basic components of resources, activities, outputs, and outcomes. Resources include any person, financial or organizational factors available to toward the work of the program. Activities are the tools, events, and actions that are part of the program implementation to bring about the intended goal. Outputs are the direct products of the program activities. Outcomes are the changes acquired during and after the program activities. These can be further broken down into short, medium, and long term impact outcomes.

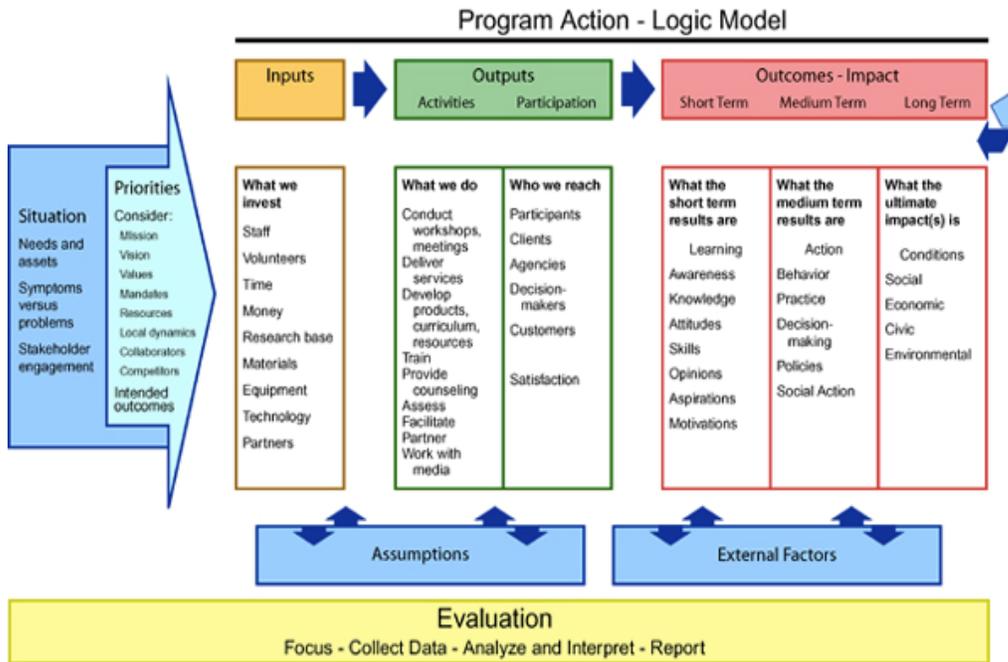


Figure 1. The Logic Model. (W.K. Kellogg Foundation, 2004).

Next, the methodology that guided this quality improvement project will be discussed.

Methods

Purpose

The purpose of this project was to improve nurses' knowledge and attitudes of early mobilization of postoperative patients on an inpatient women's care unit.

Design

This quality improvement project employed a pre-survey, intervention, post-survey design. The evidence-based educational program served as the intervention.

Sample

The participants were 48 registered nurses from the inpatient women's care unit from all shifts. All nurses who had cared for postoperative patients within the past month were eligible to participate.

Site

This project was implemented on a 22 bed women's health/post-partum unit at a 300+ bed hospital located in New England. The inpatient women's care unit cares for female postoperative obstetric, gynecologic, genitourinary and plastic surgery patients.

Procedures

Application of the Logic Model. The framework template obtained from the University of Wisconsin Cooperative Extension of the Logic Model (Appendix A) was used to illustrate the process of development and implementation of the educational in-service program for this quality improvement project. The components of the Logic model include situation, inputs, outputs, outcomes and impact.

Situation. For this quality improvement project, the *situation* was that best practice standards for early mobilization of postoperative patients on an inpatient women's care unit were not being met as evidenced by the needs assessment.

Needs Assessment. Informal observation of inconsistent early mobilization of postoperative patients was discussed on the inpatient women's care unit and prompted chart audits and system review. Chart audits revealed that postoperative patients remained in bed longer than is best practice per evidence-based literature. Twenty random charts of postoperative patients were reviewed. Difficulties were noted in obtaining accurate information regarding mobilization due to lack of actual or real time documentation. It was noted that eight patients who arrived from postoperative recovery before noon on the day of surgery had not been mobilized out of bed until the following morning. Five additional patients had no documentation regarding activity status in the first 24 hours postoperatively. Though activity levels were incorporated into postoperative order sets, they lacked clarity and were open to interpretation.

Inputs and outputs. *Inputs* are the resources that are invested into the program. Administrative, managerial, and educator support are aspects of *input*, without which this project would not be possible. Staff willingness to expend time and effort are necessary resources. Commitment to education and participation of pre and post surveys are vital for success. *Outputs* are the direct activities and participation of the population. Activities within this quality improvement project included the voluntary pre and post survey and the mandatory early mobilization program competency for the nurses of the inpatient women's care unit. The education program, developed from evidence-based literature, was delivered via presentation of a power point at scheduled in-services.

Outcomes. *Outcomes* are the changes acquired during and after the program activities. Outcomes are divided into short, medium and long-term outcomes. Short-term outcomes for this project included the potential for increased knowledge of the benefits

of early mobilization of the postoperative patient. This knowledge will potentially improve confidence in nurses' to implement change in which mobilization is a priority in the nursing care provided. Medium term outcomes represented the beginning of implementing knowledge into practice. Surveillance and informal monitoring of practice is part of medium term outcomes. Long-term outcomes represent the refreezing phase of Lewin's Change Theory. Long-term outcomes include best practice standards in regards to early mobilization of the postoperative patient becoming the status quo, the ultimate impact being improved patient outcomes. The focus of this project was on short-term outcomes.

Assumptions and external factors. Assumptions and external factors are part of the Logic Model process. Assumptions for this project included that the nurses of the inpatient women's care unit's desired to provide best practice quality nursing care as well as their willingness to participate in the pre and post survey. External factors are influences that impact the project. External factors included resistance to change, which may be seen with nursing staff and providers, patient willingness to participate, staffing issues and time constraints. These external factors represented possible barriers to the success of this quality improvement project.

Program Content and Objectives. The target outcome for this quality improvement project was to improve the knowledge and attitude of early mobilization of postoperative patients demonstrated by improved scores on pre-survey/post-survey after educational intervention.

The in-service program was developed based on the needs assessment, literature review of early mobilization, personal experiences and discussion with the inpatient women's care unit's Clinical Nurse Specialist.

Procedures

Permission and Approvals. Permission and administrative approval was obtained from the Chief Nursing Officer, Chief Medical Officer and the nurse manager of the inpatient women's care unit. Prior to implementation of this quality improvement project, IRB approval was obtained from the hospital and Rhode Island College IRBs. The Clinical Nurse Specialist and management team determined that all nurses on the women's care unit would participate in the Early Mobilization of the Postoperative Patient educational in-service as part of the unit's yearly competencies. All eligible nurses were asked to voluntarily participate in the pre/post-survey as part of this project.

The nurse manager of the inpatient women's care unit introduced the plan for the educational in-service at monthly staff meetings prior to the education. Recruitment flyers (Appendix B) were posted on bulletin boards the week of the planned in-services to inform staff of mandatory education program and encourage participation. Dates and times of the scheduled in-services took into consideration shift and workload practices to encourage participation. Contact information of the program developer was posted for any questions.

Intervention. The educational intervention was presented in the form of a power point presentation presented over 15 minutes during scheduled in-services. The content presented in the in-service integrated knowledge obtained from the review of literature.

The educational intervention was presented as part of mandatory annual competency training. The content and objectives are illustrated in Table 1 below.

Table 1. <i>Program Content and Objectives</i>	
Program Content	Program Objectives
Complications of immobility.	Able to identify risks and complication of immobility.
Benefits to early mobilization of the postoperative patient.	Describe the benefits of early mobilization of the postoperative patient in the women's care unit setting.
Perceived barriers to change and nursing interventions to overcome barriers.	Discuss challenges to practice change and solutions to enact change.
Mobility documentation.	Able to discuss where in patients' record mobility should be documented.
Communication of mobility in hand-off report.	Describe importance of communication of mobility in hand-off report.

Five in-services were scheduled during the month of April at times designed to maximize attendance of all nursing shifts.

In-services were held in the conference room on the inpatient women's care unit. An IRB approved informational letter (Appendix C) was distributed and verbally explained prior to distribution of the pre-survey (Appendix D). An incentive to participate in the pre and post survey study was the opportunity to be entered into a raffle to win a \$50 gift card to an area restaurant. A raffle ticket was attached to the post-survey and placed into a sealed box for entry and drawn after all in-services were complete.

No identifiable participant information was requested as part of the survey. Participants were asked to provide a unique numeric identifier on both pre and post survey for the purpose of individual in addition to aggregate comparisons. Pre-tests were completed and placed in an envelope; the envelope was sealed when all pre-tests were

deposited. Next, the educational program was presented and questions answered. Then, the post-survey with unique identifier placed in the lower left corner was distributed for voluntary completion. The attached raffle ticket was separated from the post-survey and placed in a sealed box. The completed post-surveys were placed by participants in an envelope which was sealed when all were completed. Participants were then asked to complete a program evaluations (Appendix E), which was modified from the Rhode Island State Nurse Association program evaluation form.

The pre- and post-tests were stored in the unit manager's office until completion of all in-services. After all staff attended the in-service, a raffle ticket was drawn and the winner awarded the gift certificate.

Measurement.

A survey developed by Dafoe et al. (2015) was adapted for the use of this project. The original survey was published in an article entitled, "Staff Perceptions of the Barriers to Mobilizing ICU Patients" and designed for the use of medical, nursing and physiotherapy ICU staff members. The survey was purpose-designed and cycled between researchers for content and clarity. The final draft was given to senior members of the medical, nursing, and physiotherapy staff for comprehensive review and feedback. Dafoe, Stiller, & Chapman acknowledged that they did not attempt to assess for reliability and validity in their purpose-based survey and noted this as a limitation in their study (2015).

The adapted survey (Appendix E.) was modified to a 10-question pre and post survey to address the purpose of this project. Modifications to the Dafoe et al. survey included the addition of five multiple choice knowledge-based questions, the removal of

descriptive information of participants and reduction in the amount of opinion-based statements to be evaluated. Focus was placed on attitude and barrier statements that would pertain to the postoperative patient population, rather than the ICU.

The pre and post survey was used to measure nurses' knowledge and attitude of early mobilization of the postoperative patient. A 10cm visual analogue scale was used to measure five opinion-based statements and multiple-choice format questions were used to measure five knowledge-based questions. The pre and post surveys were reviewed for content and clarity by the management team. It was requested that a question regarding proper documentation and communication of the mobilization status of the postoperative patient be added. This was added as the fifth opinion-based statement within the survey. The pre and post survey were constructed to be identical and were expected to take approximately five minutes to complete.

Data Analysis.

Data were analyzed using descriptive statistics. Knowledge-based questions and opinion-based statements were evaluated separately. Results of pre-and post survey knowledge-based questions analyzed the correct responses per individual and by aggregate. Box-plot analysis was used to interpret responses to opinion-based statements.

Next, the results will be presented.

Results

Twenty-five of a possible 48 nurses (52%) completed the pre-survey, educational in-service, and post-survey. The pre-survey/post-survey consisted of two sections: five multiple choice knowledge-based questions (questions 1-5) and five opinion-based statements answered by marking a visual analogue scale (questions 6-10). Each section will be analyzed and presented separately.

Results of participants' knowledge-based pre-survey and post-survey scores are illustrated in *Figure 2*.

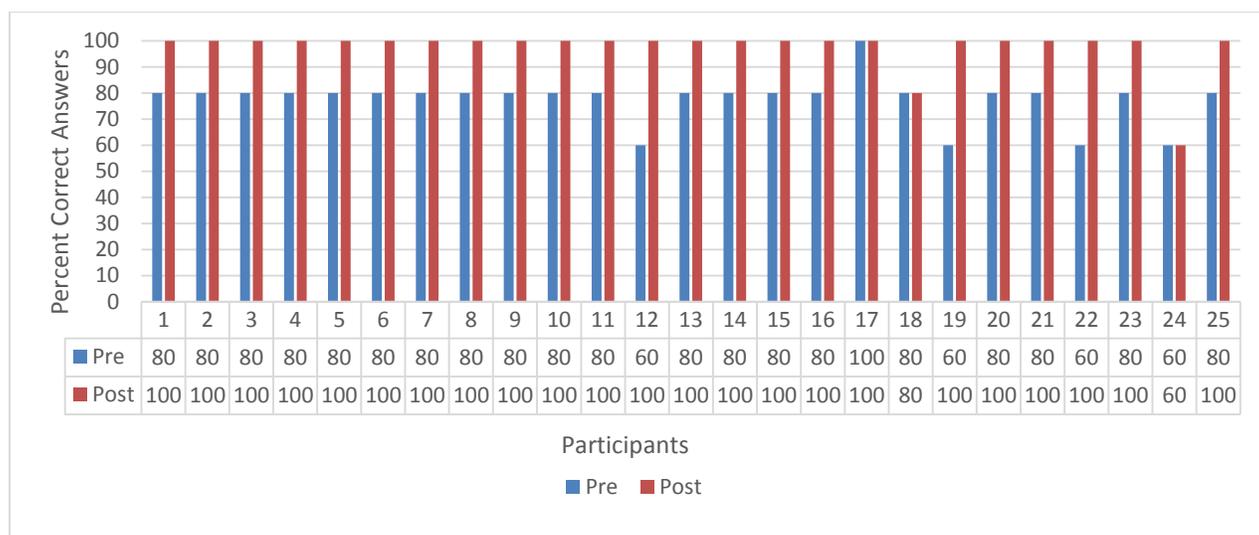


Figure 2. Comparison of pre-survey and post-survey knowledge-based question scores.

Pre-survey scores ranged from 60 to 100 out of a possible 100, with a mean score of 77.6%. Post-survey scores ranged from 60 to 100 out of a possible 100, with a mean score of 96.8%. All post-survey scores either stayed the same or increased. Overall, post-survey scores increased by 16.8%.

A breakdown of correct responses of individual knowledge-based questions are illustrated in Table 2.

Table 2

Breakdown of Correct Responses of Individual Knowledge-Based Questions

Question Number	Pre-Survey (n=25)	Post-Survey (n=25)
1	100% (25/25)	92% (22/25)
2	4% (1/25)	96 (24/25)
3	100% (25/25)	100% (25/25)
4	84% (21/25)	100% (25/25)
5	100% (25/25)	100% (25/25)

Individual knowledge-based question scores on the pre-survey ranged from 4% to 100% correct and on the post-survey ranged from 92% to 100% correct. There was noted to be a decrease in the correct response rate in question one, a knowledge-based question, from pre-survey (100%) to post-survey (92%). Question one asked if the statement, “The benefits of early mobilization of the postoperative patient are only seen in the older adult and elderly population”, was true or false. The greatest improvement was noted in question two where participants were asked, “In a survey of more than 1000 nurses, what percent of nurses state ambulation as a missed element in the care of their patients?” Correct responses improved by 92% from the pre-survey (4%) to the post-survey (96%). Question three was answered correctly 100% of the time in both the pre-survey and post-survey. Question three asked the participants to identify complications of immobility for the postoperative patient. An increase of correct responses of 16% was noted on question four, which asked participants the affect early mobilization has on post cesarean mother’s pain control. Question five was answered correctly in 100% of the responses in both the pre-survey and the post-survey. Question five asked if the participants agreed with the statement that early mobilization has a positive effect on post cesarean mothers’ ability to void after indwelling catheter removal.

Participants were asked to mark their responses on a 10-point visual analogue scale to opinion-based statements. Responses to opinion-based statements are illustrated in *Figure 3*. Boxes depict 25th percentile, median and 75th percentile. X represents mean value of responses. Whiskers depict minimum and maximum values.

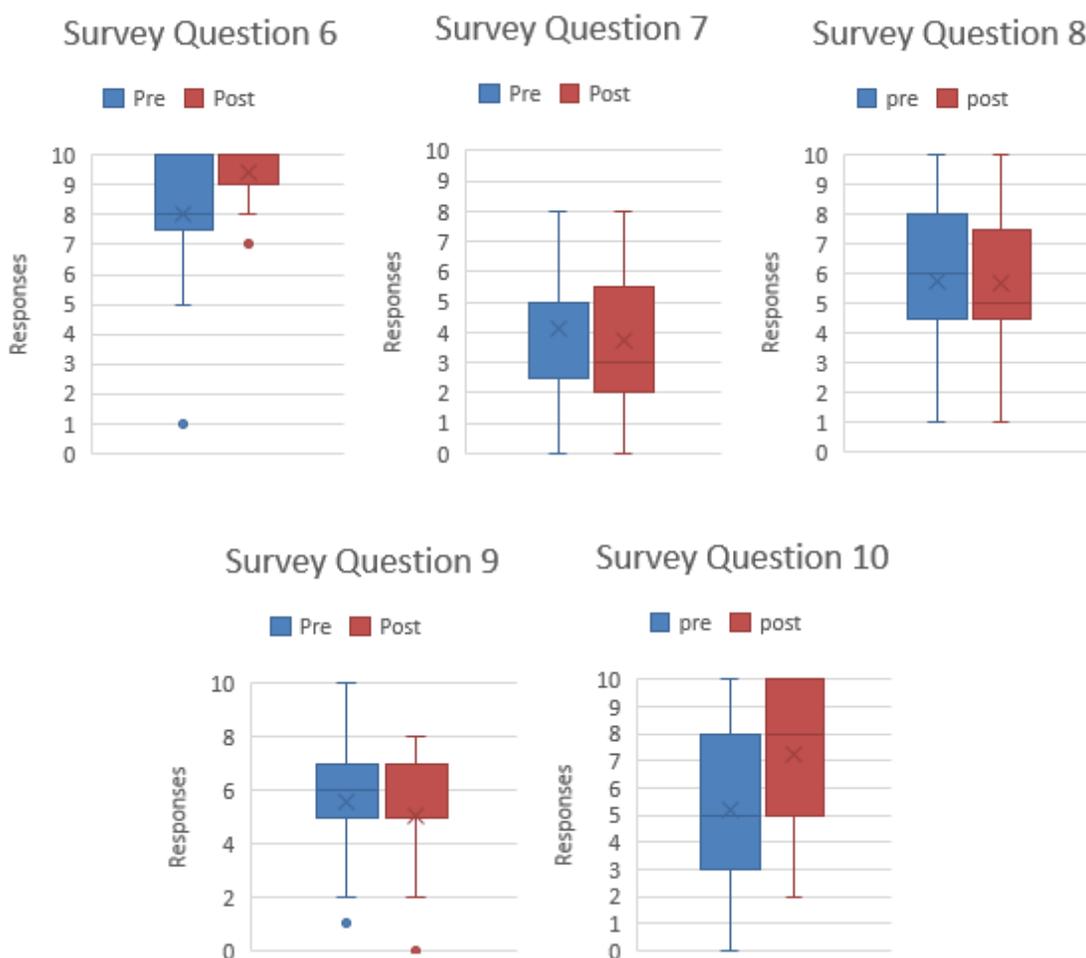


Figure 3. Pre-survey and post-survey responses to opinion-based statements.

For evaluating responses for questions six, seven, and ten, the visual analogue scale of 0-10 represented responses from ‘strongly disagree’ to ‘strongly agree’.

Responses for questions eight and nine, the visual analogue scale of 0-10 represented ‘never prevents’ to ‘frequently prevents’. Question six and ten showed the most change

in mean scores from pre-survey response to post-survey response. Question six asked the opinion of the statement “Mobilization is as important compared to other aspects of care”. Pre-survey responses ranged from 1 to 10 with a mean of 8. Post-survey responses ranged from 7 to 10 with a mean of 9.44. Question seven asked the opinion of the statement, “There is adequate inter-disciplinary communication regarding which patients need to mobilize, how they should mobilize, and when this should be done”. Responses ranged from 0-8 in both pre-survey and post-survey, with a slight decrease in the mean score of 4.12, pre-survey to 3.76, post-survey. Minimal change was noted in the opinion statements of questions eight and nine. Both of these statements discussed time and pain as barriers to the mobilization of patients. The mean score of question eight, regarding time as a barrier, showed minimal change from pre-survey at 5.76, to post-survey at 5.68. Question nine, regarding pain as a barrier, showed a slight decrease in the mean response pre-survey of 5.56 to post-survey of 5.08. Question ten asked the opinion of the statement, “I am confident in where I should document and what I should communicate regarding mobilization of postoperative patients on the Women’s Care Unit”. Pre-survey responses ranged from 0-10, with a mean of 5.2. Post-survey responses ranged from 2-10, with a mean of 7.24.

Program Evaluation

The purpose of the evaluation form (Appendix E) focused on whether objectives were met, quality of the presenter, utilization of presented material and appropriateness of the learning atmosphere. One-hundred percent of participants completed the evaluation form (n=25). The scale for each statement was based on a five-point response format: 5-outstanding; 4-exceeded expectations; 3-met expectations; 2-needs improvement; and 1-

unsatisfactory. Evaluations were favorable. All participants (100%) rated objectives being met; quality of presenter; and utilization of material as “outstanding” (5). Responses of the appropriateness of the learning atmosphere ranged from 4 (n=2), “exceeded expectations” to 5 (n=23), “outstanding”. Participants verbally commented on the cleanliness of the conference room and their ability to participate in the educational in-service during work hours.

Next, the summary and conclusions will be discussed.

Summary and Conclusions

Early mobilization of the post-operative patient is associated with reduction in incidence of post-operative complications. “Early ambulation is the most significant general nursing measure to prevent postoperative complications” (Lewis et al., 2014, p. 356). Informal observation by nursing management and the clinical nurse specialist on the inpatient women’s care unit identified inconsistent mobilization of postoperative patients, prompting a chart audit. Chart audits revealed that postoperative patients remained in bed longer than is best practice per evidence-based literature. Literature clearly supports early mobilization of the postoperative patient. Current research demonstrates a decrease in complication rates, reported pain and length of stay when early ambulation is initiated (Dube et al., 2013; Havey et al., 2013; Pearse et al., 2007). Nurses are required to make practice changes that are supported by the latest evidence. Changes in practice involve the acceptance of new knowledge, the understanding of research and successful implementation strategies (Abrahamson et al., 2012; Brown et al., 2009). The barriers most frequently perceived by staff were time constraints, communication and staff availability (Dafoe et al., 2015; Kalisch et al., 2011).

A quality improvement project was developed using a pre-survey, educational intervention, post-survey design with the purpose of improving nurse knowledge and attitude of early mobilization of the postoperative patient. The content of the educational intervention intergrated knowledge obtained through the literature review and was delivered in the form of a 15 minute Power Point presentation. The educational intervention was presented as part of the women’s care unit’s annual competency training. Prior to implementation, approvals were obtained from the institutional IRB and

administrators, as well as the Rhode Island College IRB. Staff was informed of the educational inservices by the nurse manager at monthly staff meetings leading up to implementation. Recruitment flyers were posted the week of the planned inservices with scheduled dates and times. Pre-survey and post-survey were completed prior to and immediately after the educational inservice by those who volunteered to participate. Pre-survey and post-survey responses were compared to assess for improved knowledge and attitudes of early mobilization of the postoperative patient.

Twenty-five of a possible 48 nurses (52%) completed the pre-survey, educational in-service, and post survey. The pre-survey/post-survey consisted of two sections, knowledge-based questions and opinion-based questions. Each section was analyzed separately. Of the knowledge based questions, all post-survey scores, either stayed the same or increased. Overall, post-survey scores increased by 16.8% and knowledge was improved when compared to the pre-survey. When individual knowledge-based questions were compared, an increase in correct responses from pre-survey to post-survey was seen in all but one question. The correct response rate for question one, “the benefits of early mobilization of the postoperative patient are only seen in the older adult and elderly population”, the true/false correct response rate went from 100% to 92% in the post-survey. The reason for this decrease in correct responses was not understood. All nurses correctly responded in both the pre-survey and post-survey to questions regarding the complications of immobility and the positive effect of early mobilization of the postoperative patient. Nurses’ knowledge of early mobilization was determined to be high.

Opinion-based questions were developed to gain insight into nurses' attitudes regarding the importance of barriers to and communication of early mobilization in their practice. When asked the importance of mobilization in comparison to other aspects of care, the mean score of 8 on a visual analogue scale of 1 to 10 improved to 9.44 on the post-survey. Minimal change in pre-survey and post-survey responses were noted regarding time (pre-survey \bar{x} =5.76; post-survey \bar{x} =5.68) and patient's pain (pre-survey \bar{x} =5.56; post-survey \bar{x} =5.08) as barriers to early mobilization. Since the design did not allow for time to apply knowledge gained through the in-service, the lack in change of responses related to perceived barriers was expected. The nurses' ability to communicate and document mobilization, represented by question 10, showed the largest improvement from pre-survey to post-survey (\bar{x} =5.2; pre \bar{x} =7.24 post).

Several limitations were acknowledged in this project. Recruitment flyers and nurse management acknowledgement were the only forms of advertisement. High hospital census and limiting the time allotted for in-services to one week may have affected number of participants. The design of this quality improvement project required volunteer participation. The limitations of volunteer response bias and the tendency to over-representation of individuals with strong opinions must be considered. The scope of this project limited the evaluation of practice change. The challenge of transferring the knowledge acquired through the training to practice change is further acknowledged. Inter-disciplinary collaboration has been shown in the literature of having a positive effect as a strategy for implementing change. Lack of inter-disciplinary collaboration within this project is noted as a limitation. Lack of labor resources was noted to be a significant barrier to early mobilization in the literature. The fact that this project was

implemented on an inpatient women's care unit limits its implications to only female patients; further study with a broader sample is indicated. Further, the pre-survey and post-survey was designed for this specific quality improvement project and was not tested for reliability and validity, limiting the interpretation of the results.

In conclusion, nurses play a key role in the early mobilization of postoperative patients. The educational in-services were successful in improving the nurses' knowledge and attitude of early mobilization of the postoperative patient. Evaluation of practice change will require further assessment. Organizational systems and interdisciplinary support, resources and continuing education will be critical elements in the successful integration of early mobilization into nursing practice.

Next, recommendations and implications for advanced nursing practice will be discussed.

Recommendations and Implications for Advanced Nursing Practice

Advanced Practice Registered Nurses (APRN) are a vital part of the healthcare system, ensuring quality and improving outcomes. The APRN regardless of setting must model the roles of leaders, facilitators and mentors in identifying needs and achieving practice standards that are grounded in current evidence-based literature. The Clinical Nurse Specialist (CNS) is in the ideal position to maintain organizational awareness of the clinical setting as well as the overall system. Outcome measures have become the focus in health care related to hospital reimbursement rates and penalties. The CNS has a central role in improving nurse-sensitive outcomes. Early mobilization as an intervention is linked to nurse-sensitive outcomes such as fall rates, length of stay and pressure ulcers. The CNS influences outcomes and practice through three spheres: the patient; the nurse; and the system.

As a facilitator of change, the CNS uses evidence based practice to guide staff members in developing, implementing, and evaluating initiatives to improve the safety and quality of patient outcomes. In this quality improvement project, the APRN student identified the unit-based need for improved practice of early mobilization of the postoperative patient. The CNSs' expert clinical judgment and inquiry serves the patient by optimizing outcomes. It is crucial to lead by example when implementing and advocating new practices and ensuring staff accountability. Communicating the benefits of early mobilization to the patient incorporates them as a member of the team in the collaboration and decision making aspects of care. Implementing early mobilization as an intervention in the inpatient postoperative patient has the potential to improve the health of the overall public.

The CNS is uniquely positioned to evaluate the learning needs and implement various methods of educating nurses, with the goal of safe and quality patient care. The CNS is critical in keeping nurses informed of evidence-based practice changes. The CNS can review and understand current literature in order to disseminate information to the bedside nurse that is meaningful to their practice. The CNS is knowledgeable in the technologies of simulation and computer-based learning to assist in the delivery of education to nurses. The CNS can lead in the replication of the education presented in this quality improvement project to educate hospital-wide the benefits of early mobilization. The CNS ensures policies and protocols are readily available to the bedside nurse and reflect current practice.

Collaboration with other disciplines allows the CNS to have an influence over the system in whole. Strategies to assist in the implementation of an early mobilization initiative should include an interdisciplinary approach. The CNS can facilitate the collaboration of bedside nurses, practitioners, physicians, physical therapy, and the lift team in the discussion of an early mobilization initiative. The CNS collaborates with informatics influencing and suggesting change that would promote best practice through accurate and consistent documentation.

The limitations and the intended scope of this project presented opportunities for future research. Projects that focus on overcoming known barriers to early mobilization will assist in integrating implementation strategies to future initiatives. Research that includes control and intervention groups to trial specific implementation strategies would allow the ability to evaluate short term practice change. An evaluation piece such as chart reviews at a future date will provide the opportunity to ensure change has been

embedded into practice, becoming the new status quo. The APRN, specifically the CNS, has the ability to devise, implement, and evaluate such initiatives with the purpose of achieving integration of evidence based knowledge into practice and improving patient outcomes.

The APRN has responsibilities that impact the public by means of preventative and population health. The CNSs' involvement and active participation in professional practice organizations provides the opportunity to advocate for policies at the local, state and national level. Professional practice organizations allow the CNS connections to network and share information widening their scope of knowledge beyond their health care system.

The APRN, specifically the CNS, has expertise that has been proven invaluable in the implementation of practice change, policy development and organizational presence that ensures that patient care is safe, evidence-based and patient-centered. The CNS is an integral part of the interdisciplinary team guiding the patient through the healthcare system.

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Appendix A

Early Mobilization of the Postoperative Patient Logic Model

Program: Early Mobilization of the Postoperative Patient Logic Model

Situation: Immobilization of the postoperative patient can lead to poor outcomes. Best practice standards for early mobilization of postoperative patients on an inpatient women's care unit were not being met. Developing an educational program will increase the nurses knowledge and priority of early mobilization of the postoperative patient.

Inputs	Outputs		Outcomes -- Impact		
	Activities	Participation	Short	Medium	Long
Administrative support	Pre-test	Nurses	Increased knowledge of benefits of early mobilization of the postoperative patient	Beginning of implementing knowledge into practice	Best practice standards become the status quo
Managerial support	Mandatory Educational In-service	Administration		Surveillance	Improved patient outcomes
Educator's support	Post-test	Manager	Increases confidence	Informal monitoring of practice	
Staff willingness	Mentoring	Clinical Nurse Specialist	Increase priority of early mobilization incorporated into nursing care	Change phase- Lewin's Theory of Change	Freezing phase- Lewin's Theory of Change
Time	Surveillance				
Commitment	Monitoring		Unfreezing phase- Lewin's Theory of Change		

Assumptions

Nurses desire to provide best practice quality nursing care, and their willingness to participate in the pre and post-tests.

External Factors

Resistance to change, which may be seen with nursing staff and providers, patient willingness to participate, and time constraints.

Appendix B
Recruitment Flyer



- Education about Early Mobilization of the Postoperative Patient will be part of the Women's Care 2017 Annual Competencies and will be presented as an in-service in April.
- As part of my Master's Project, I am recruiting staff to take part in a voluntary short survey pre- and post- presentation. The pre- and post- survey is to assess understanding about early mobilization.
- The survey will be completely anonymous. All Survey participants are eligible to be entered into a raffle for a \$50 gift certificate to an area restaurant.
- Please consider helping me in this important project. If you have any questions, please contact me.
- See attached for dates and time information.

Thank you,

Laurie Chatterley, RN, BSN

Rhode Island College Graduate Student

401-527-1642

lchatterley@kentri.org



⦿Attention All Women's Care Center Nurses⦿

Please attend one of the scheduled in-services

(In-services will run every 30 minutes with-in the time frames)

TBA

Date	Times
Saturday, April 1, 2017	5p-7p
Sunday, April 2, 2017	11:30a-1p
Monday, April 3, 2017	7:30a-9a
Tuesday, April 4, 2017	5:30-7a
Wednesday, April 5, 2017	9:30p-11p

Appendix C

Informational Letter

To All Women's Care Center Registered Nurses.

I would like to inform you of a survey that you are invited to participate in. All Registered Nurse staff of the Women's Care Center at Kent County Memorial Hospital were identified as possible participants in this survey because you work on the unit and this educational program will be presented as part of the 2017 Women's Care Center Mandatory Competencies. The purpose of this project is to improve nurses' knowledge and attitudes about mobilization of the post-operative patient. There will be multiple 30 minute in-service sessions on five different dates to choose from. The in-services will take place in the Women's Care Center conference room.

Participation in the survey will assume consent. If you participate in the survey, you will be asked to answer ten questions to test your knowledge before and after the educational session. The survey requires you to indicate a unique identifier on the last page in the lower left corner to compare both surveys for data collection. You can place both surveys in the sealed box before you leave the conference room. Both of the survey responses will be anonymous. The data collected from both surveys will be utilized for graphing and trending purposes.

Your decision to participate or not participate in the survey will not impact your position in any way. While participation in the competencies is mandatory, completion of the survey is not. As a thank you for participating in the pre- and post-survey you are eligible to be entered into a raffle for a \$50 gift certificate to an area restaurant.

Thank you for your consideration of this request.

Please contact me with any questions or concerns at 401-527-1642 or lchatterley_7715@email.ric.edu. You may also contact my faculty project advisor Dr. Cynthia Padula at 401-456-9720 or cpadula@ric.edu. If you think you have a complaint about this study or would like to talk to someone other than the researcher about your rights as a research participant, please contact Dr. Jonathan Gates, the Kent IRB Chair at 401-921-7222 or sdossantos@carene.org or the RIC IRB Designate at IRB@ric.edu, by phone at IRB@ric.edu.

You will be given a copy of this form to keep

Laurie Chatterley, RN, Rhode Island College, Candidate for Master of Science in Nursing
lchatterley@kentri.org
lchatterley_7715@email.ric.edu
401-527-1642

Appendix D

Pre and Post Survey

Please circle the correct response.

1. The benefits of early mobilization of the postoperative patient are only seen in the older adult and elderly population.
 - a. True
 - b. False**

2. In a survey of more than 1000 nurses, what percent of nurses state ambulation as a missed element in the care of their patients?
 - a. 32.3%
 - b. 51.4%
 - c. 76.2%
 - d. 86.6%**

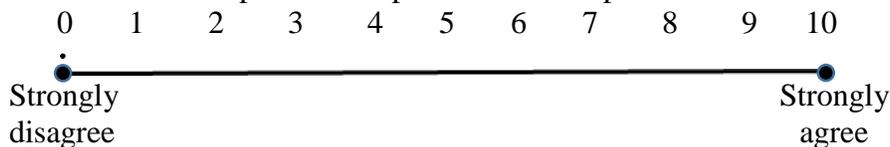
3. The complications of immobility for the postoperative patient include...
 - a. Increased risk of thromboembolism
 - b. Increased risk of pneumonia
 - c. Decrease in metabolic rate
 - d. Constipation
 - e. All of the above.**

4. Research shows that early mobilization of post cesarean mothers has this affect on pain control.
 - a. Patients will have an increase in pain with early mobilization.
 - b. Patients will require less pain medication to achieve satisfactory pain relief.**
 - c. Patients will require more pain medication to achieve satisfactory pain relief.
 - d. Early mobilization has no effect on pain management.

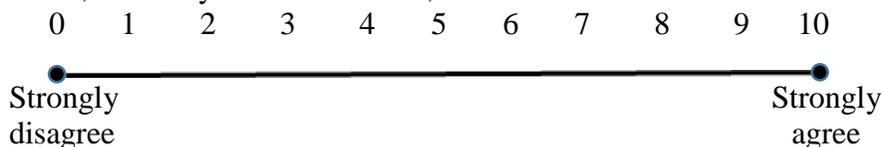
5. Early mobilization has a positive effect on post cesarean mothers ability to void after indwelling catheter removal.
 - a. True**
 - b. False

Please mark on the visual analogue scale your opinion on the statements provided.

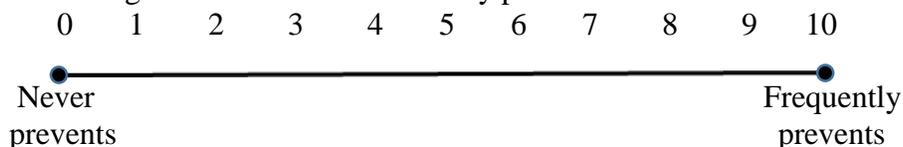
6. Mobilization is as important compared to other aspects of care.



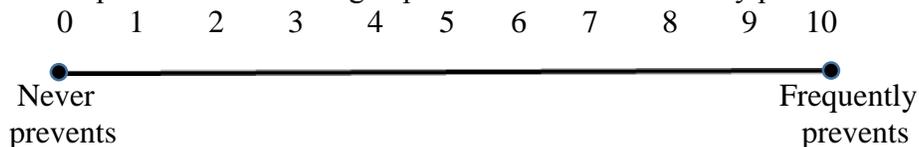
7. There is adequate inter-disciplinary communication regarding which patients need to mobilize, how they should mobilize, and when this should be done.



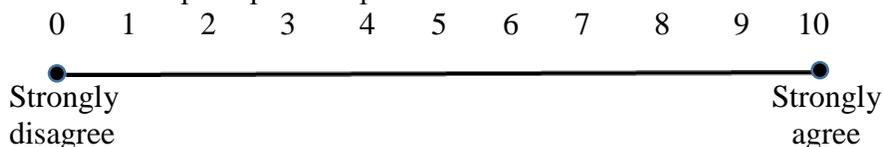
8. There is adequate time to mobilize of my patients.



9. Patients' pain/discomfort/fatigue prevent mobilization of my patients.



10. I am confident in where I should document and what I should communicate regarding mobilization of postoperative patients on the Women's Care Unit.



Unique Identifier _____

Appendix E
Kent Hospital
Department of Education
Evaluation Form

TITLE: Early Mobilization of the Post-Operative Patient

DATE: April 2017

5=Outstanding, 4=Exceeded Expectations, 3=Met Expectations, 2=Needs Improvement, 1=Unsatisfactory

Objectives	5	4	3	2	1
Able to identify risks and complication of immobility.					
Able to describe the benefits of early mobilization of the postoperative patient in the women's care unit setting.					
Able to discuss challenges to practice change and solutions to enact change.					
Able to describe importance of communication of mobility in hand-off report.					

Presenter- Laurie Chatterley	5	4	3	2	1
The instructor was prepared in the course's content.					
The instructor has an effective presentation style.					
The instructor was knowledgeable of the subject.					
The instructor used time effectively & properly paced the course.					
Conflict of interest was disclosed.					

Evaluation	5	4	3	2	1
I have increased my knowledge of the subject matter.					
I will be able to utilize the skills learned in this class?					
The facility was neat, clean and appropriate for learning.					