CE

1.5 ANCC Contact Hours

Nursing Care of the Patient Undergoing an Anterior Approach to Total Hip Arthroplasty

Candy Mori ▼ Danny Hageman ▼ Katie Zimmerly

The anterior, anterolateral, direct lateral, transtrochanteric, and posterior techniques have historically been the surgical approach to a total hip arthroplasty; however, a forthcoming technique called the direct anterior approach has been demonstrated to produce many patient and physician quality outcomes. These favorable outcomes can include shorter hospital stay, earlier mobility and functionality, decreased medical costs, and increased patient satisfaction scores. Appropriate nursing care during the preoperative, intraoperative, and postoperative phases is essential. The purpose of this article is to describe the nursing care for a patient undergoing a direct anterior approach to hip arthroplasty.

Total hip arthroplasty (THA) has been around for 65 years and has proven to be a very successful surgical procedure in relieving pain, restoring mobility, and improving quality of life for those who suffer from arthritis (American Academy of Orthopaedic Surgeons, n.d.). Over the years, vast improvements have been made in THA surgical technique, which has only increased its effectiveness. Because of the aging demographics of the U.S. population, more and more people will be seeking out THAs. According to one study, by 2030, a total of 572,000 THAs will be performed annually (Kurtz, Ong, Lau, Mowat, & Halpern, 2007). These patients will be looking for surgeons who are up to date on the most current technology and practices and nurses who can care for them postoperatively. Ideally, patients want an optimal surgical approach that minimizes the risks of surgery and nurses who can help them recover to reach the best possible outcome. The direct anterior approach (DAA) to hip arthroplasty has been demonstrated to meet these patient measures. The purpose of this article is to describe the nursing care for a patient with DAA.

The anterior, anterolateral, direct lateral, transtrochanteric, and posterior techniques have been the traditional surgical approaches to THA (Barrett, Turner, & Leopold, 2013). These approaches, however, involve dissection of muscle bundles with risks of partial denervation, tendon detachment, and incomplete healing (Hallert, Li, Brismar, & Lindgren, 2012). These unwanted side effects of surgery can produce a weakness of the hip abductor muscles and a noticeable limp. Some patients who have one of the aforementioned procedures for a THA continue to suffer from pain and decreased activity levels. Reasons for this may include failure of fixation, instability, and damage to soft tissues from the surgical approach (Bremer, Kalberer, Pfirrmann, & Dora, 2011). For these reasons, the DAA has been recently researched, finding more positive outcomes for patients with THA.

The Direct Anterior Approach

The DAA is a minimally invasive technique used in hip replacement surgery (Rachbauer & Krismer, 2008). This procedure can have several advantages over the more traditional approaches. The DAA requires only an incision approximately 3–4 inches long that is located on the anterior side of the hip that does not require detaching any of the muscles or tendons. In contrast, the traditional hip replacement techniques require operating from the lateral or posterior of the hip, which significantly disturbs the joint and connecting tissues. Because the incision is made on the lateral or posterior side of the hip, the incision has to be approximately 8–12 inches long. With the DAA, muscles are spared, which theoretically leads to improvements in the early postoperative recovery period (de Verteuil et al., 2008; Mayr et al., 2009; Zawadsky, Paulus, Murray, & Johansen, 2014).

Studies of the DAA have found the recovery period to be shorter, which decreases medical costs and increases patient satisfaction scores (Zawadsky et al., 2014). Zawadsky et al. (2014) found length of stay decreased by at least 1 day compared with patients who had posterior

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hip replacement. They also found patients with DAA were more likely to be discharged home than to a rehabilitation facility. Benefits in terms of postoperative pain scores and functional recovery were also noted in patients with DAA (Barrett et al., 2013; Zawadsky et al., 2014). Postoperatively, patients with DAA are able to progress faster from a walker to a cane and to no assistive device at all, demonstrating an increase in functionality and mobility (Bhandari et al., 2009; Nakata, Nishikawa, Yamamoto, Hirota, & Yoshikawa, 2009; Rodriguez et al., 2014). In addition, the burdensome posterior hip precautions, such as no bending greater than 90°, no crossing legs, and no excessive rotation, do not have to be enforced with the DAA. All of these advantages can provide a significant cost savings, as well as a faster progression to an improved quality of life following a DAA compared with a THA.

Preoperative Procedures

Patient Selection

The first step in preoperative procedures is deciding who is a candidate for the DAA. Not all patients are candidates for this approach to hip replacement. Some major restrictions include a large body mass index or a medical history of femoral deformities (Bender, Nogler, & Hozack, 2009). Another study discovered the DAA to be problematic for those patients who were morbidly obese, were very muscular, or had a short femoral neck or acetabular protrusion (Hallert et al., 2012). The exposure can be more difficult in muscular patients; however, it is not contraindicated (Bender et al., 2009).

Preadmission Testing

Preadmission testing is an important first step in the perioperative process. The goal of this testing is to identify risks and optimize conditions that may increase morbidity and mortality in the surgical patient (Feely et al., 2013). Some routine tests may involve chest radiography, electrocardiogram, and laboratory tests including blood testing and urinalysis. The blood testing should include hemoglobin, hematocrit, blood type, and screening to document a baseline value. To avoid a delay in surgery, the preadmission testing should not be done on the day of the procedure. For example, if the routine blood work is drawn on the day of surgery and results in an electrolyte imbalance, this could delay the procedure. If the blood work had been done a week in advance of the surgery, this would allow time for the primary care physician to address the abnormal result. All of the routine testing should be based on the physical examination and patient history (Feely et al., 2013). The testing should not be based solely on gender or age. For instance, a diabetic patient may have a blood sample for hemoglobin A_{1c} drawn in addition to other blood testing.

Chlorhexidine Gluconate Bathing

Chlorhexidine gluconate (CHG) 4% is prescribed for patients to shower with prior to their surgical procedure. Chlorhexidine gluconate is effective against gram-positive and gram-negative microorganisms (Petlin et al., 2014). Patients are to begin bathing using the CHG product every day, starting 5 days prior to their scheduled procedure including the day of their surgery (Institute for Health Care Improvement, 2012). It is important to note that the product should be used on areas from the neck down while avoiding the mucous membrane of the vagina, as this could cause irritation. In addition, the product should not be used on open wounds.

MRSA And MSSA Testing

Methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-susceptible *Staphylococcus aureus* (MSSA) testing is often performed on patients receiving implanted materials such as the patient undergoing an anterior THA. The test usually involves a swab of the anterior nares. Appropriate screening and treatment to decolonize patients with MRSA or MSSA in the nares can potentially eliminate the risks of surgical site infections (Mori, 2015). A test result will determine the preoperative antibiotic. A positive result for MRSA will necessitate antibiotics to include vancomycin or telavancin, just to name a few. If the test result is positive for MSSA, the patient may receive a more routine preoperative antibiotic such as clindamycin or cefazolin. The goal of the MRSA and MSSA screening is to identify those patients who already have the bacterium so that they can be treated preoperatively. Treatment of MRSA can be as simple as receiving susceptible antibiotic therapy preoperatively such as those mentioned earlier. Both testing and treatment are instrumental in obtaining optimal patient outcomes. They can also reduce hospital stays by identifying those patients who are already carriers so that treatment can begin immediately. An infection can be debilitating to any surgical patient, but in a patient who has received hip implants, an infection could be catastrophic. If the new joint becomes infected, the implants may need to be removed and replaced. This is very costly and will cause undue hardship to the patient.

It is important for nurses caring for patients to remember to use proper hand washing techniques at all times to reduce the incidence of passing the bacteria from patient to patient. In addition, it is important for nurses to stress the importance of hand washing to the patient and the family to prevent infection.

Patient Education

Patient education is a key component for a patient undergoing DAA. Extensive education should be provided for the patient prior to surgery regarding preadmission testing, infection prevention, what to expect after surgery, and home care. Preoperative education provided by nurses in a private one-on-one setting can improve patient outcomes and satisfaction with the whole surgical experience (Kruzik, 2009). In the perioperative setting, nurses can provide patient-centered teaching with a thoughtful approach to each patient's learning needs. This environment provides the ideal setting to stress the importance of infection prevention such as following all CHG bathing instructions, frequent hand washing, and postoperative incisional care.

Intraoperative Care

Anesthesia

The DAA to hip arthroplasty is done under regional anesthesia or general anesthesia. Regional anesthesia offers advantages of decreased deep vein thrombosis, pulmonary embolus, and intraoperative bleeding (Jaffe, Samuels, Schmiesing, & Golianu, 2004). Difficulties with regional anesthesia come with the positioning requirements with the induction, which is sometimes uncomfortable for patients with limited mobility. General anesthesia should be offered to supplement regional anesthesia as needed.

Responsibilities of the Nurse

Before the surgical procedure begins, the circulating nurse is responsible for setting up the operating room according to the surgeon's preference. The circulating nurse also checks all equipment and verifies that they are functioning properly. The circulating nurse serves as a patient advocate and ensures the patient's safety while under the influence of anesthesia. When the patient enters the operating room, the circulating nurse will verify the patient's identity, double-check necessary consent forms, and confirm the nature of the procedure and site marking with the surgeon, the patient, and the surgical team. Many of these procedures performed by the circulating nurse are standardized by The Joint Commission. If ordered, tranexamic acid can be given by the nursing staff intravenously for bleeding prophylaxis prior to surgery and a second dose given 8 hours later. The circulating nurse will perform all the necessary duties outside of the sterile field. The circulating nurse positions the patient correctly on the operating room table and assists the anesthetist with hooking up monitors and connecting other necessary suction and cauterization equipment. During the procedure, the circulating nurse provides the sterile surgical team with sterile fluids, medication, any additional disposables or instruments that may be needed and ensures complete and thorough documentation in the medical record. The circulating nurse will also assist with counts and records. The circulating nurse will transport the patient to the post-anesthesia care unit (PACU) once the surgery is completed and will update the PACU nurse on the patient's condition. Following the procedure, the circulating nurse helps clean the operating room and sets up for the next procedure.

Positioning

The operating room nurse will assist with proper positioning of the patient. The patient is positioned supine on a standard operating room table or fracture table depending on the surgeon's preference. Depending on surgeon's preference and hospital contractual policies, there are many different manufactures of fracture tables. A fracture table can allow for independent positioning of the lower extremities. It can also facilitate femur exposure: The supine position provides for precise placement for the acetabular and femoral components by allowing a clear visual of the field (Schwarzkopf, 2014). Bilateral arms are crossed over the chest and secured. As an alternative, the ipsilateral arm may be draped over the chest and secured whereas the contralateral arm is placed on an arm board. The supine position creates a stable and predictable pelvis position. A hip bump may be placed under the pelvis to elevate the pelvis; by elevating the pelvis, this can aid with femoral exposure. During the femoral preparation, the patient's operative leg will need to be placed in external rotation, adduction, and extension. The fracture table permits full rotation and hyperextension of the operative leg. While supine, the patient's hips need to be positioned at the break in the bed to allow for a 30°–40° extension of the leg with no knee flexion. Adduction of the operative leg during the femoral preparation facilitates access to the femoral canal. Proper positioning can be accomplished by positioning the patient in the Trendelenburg position. To provide abduction of the nonoperative leg, an additional table attachment could be used (Stryker Corporation, 2015). Proper arm and hip positioning is essential to allow for the proper C-arm position.

Prepping And Draping

The operating surgeon and the assistant stand on the operative side. The scrub technician and a secondary nurse assistant, used to hold anterior retractors, stand opposite the affected side. Bilateral legs are prepped with a CHG- and isopropyl alcohol-impregnated scrub stick. Both legs are draped with two split "U" drapes, and a bilateral extremity drape is used in the appropriate fashion. Two impervious stockinettes are used to cover the patient's feet and up to just below the knees. Coban secures the stockinettes to the patient. Anatomical landmarks such as the anterior superior iliac spine (ASIS) and the greater trochanter are palpated and marked. An ioban occlusive dressing is placed over the entire exposed operative limb.

Joint Exposure, Preparation of the Capsule, And Removal of Femoral Head

An incision is made approximately 1 cm lateral and about 1 cm distal to the ASIS (Schwarzkopf, 2014). The skin incision is kept small at about 8–10 cm and extended if needed. The tensor fascia latae (TFL) is then identified (see Figure 1). Medially to the TFL are the main branches of the lateral femoral cutaneous nerve. To avoid damage to these nerves, the physician palpates the interval between the TFL and the sartorius muscle and establishes access laterally under the fascia of the TFL. The fascia of the TFL is incised, beginning slightly medial to its midpoint and extended in-line with the muscle fibers. The fascia is bluntly dissected from the tensor. The surgeon then gently pulls the TFL laterally to identify the fatty layer and the deep layer of the fascia latae. To find the location for the Cobra retractor, the surgeon palpates the superolateral region of the femoral neck. A Hohmann retractor is then placed inferolateral to the greater trochanter. A Hibbs retractor is used medially. The ascending branches of the lateral circumflex vessels are identified, ligated, and cauterized. Once the vessels are controlled, the vastus lateralis muscle is revealed by cutting the fascia between the rectus femoris muscle and the TFL. The precapsular fat pad is

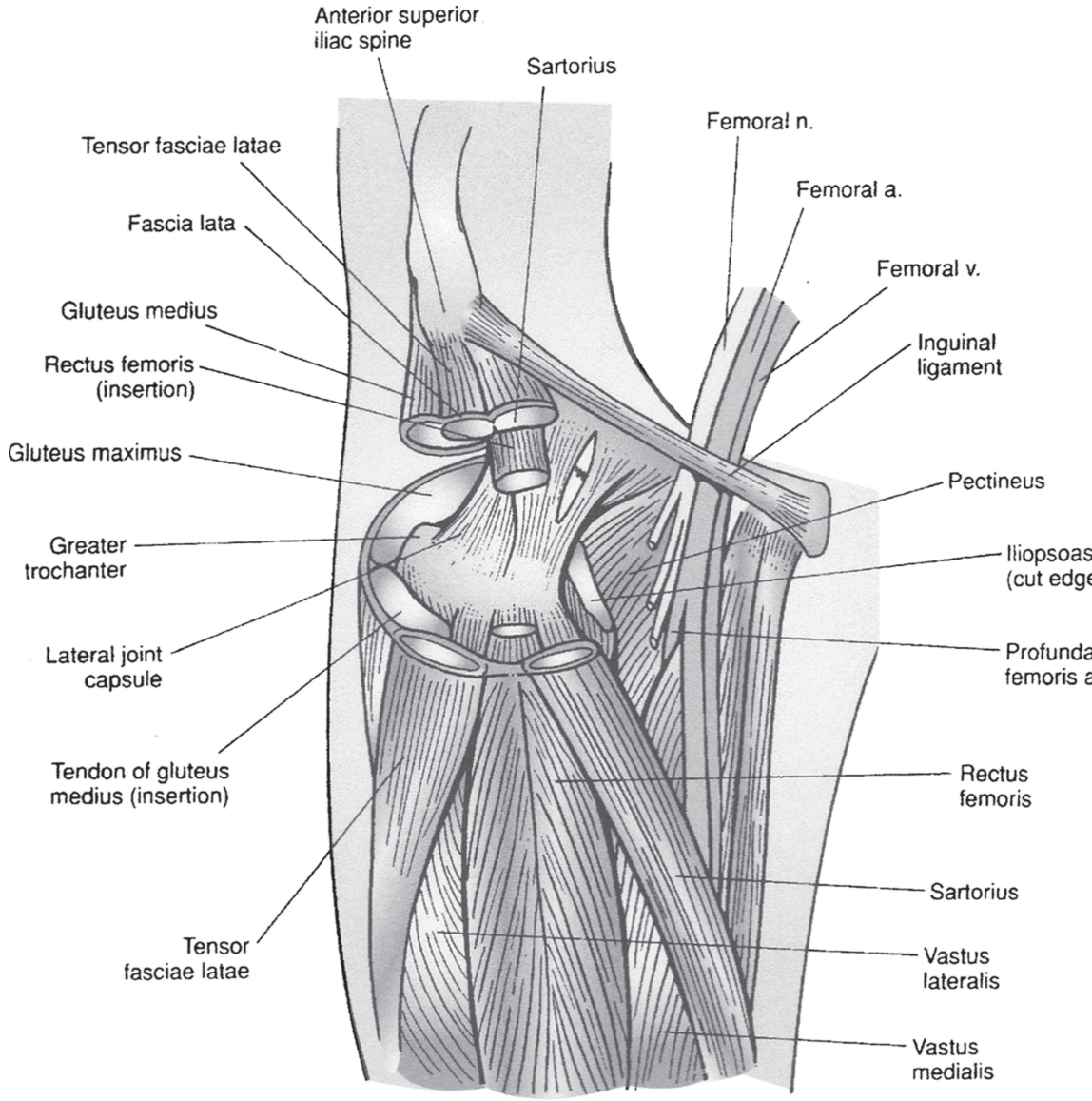

Figure 1. Hip anatomy. From "Hip, Pelvis, Upper Leg Surgery," by R. R. Jaffe, S. I. Samuels, C. A. Schmiesing, and B. Golianu, 2004, In J. I. Huddleston, M. J. Bellino, S. B. Goodman, F. G. Mihm, and C. Eggerhalbeis, (Eds.), *Anesthesiologist Manual of Surgical Procedures* (4th ed., pp. 991–1000), Philadelphia, PA: Wolters Kluwer, Lippincott Williams & Wilkins. Copyright 2004 by Wolters Kluwer, Lippincott Williams & Wilkins. With permission.

visible at this time. A blunt retractor is placed inferomedial to the neck and proximal to the vastus lateralis muscle. The rectus femoris and sartorius muscles are retracted to expose the anterior capsule in order to perform a capsulotomy. The Cobra and Hohmann retractors are then repositioned inside the capsule. The appropriate level and angle of the resection of the femoral neck are verified using the C-arm, and an oscillating saw is used to perform the femoral neck osteotomy. The osteotomized femoral neck and head are removed.

Acetabular Exposure And Preparation

With acetabular exposure, the scrub nurse will assist with holding retractors and therefore needs to be aware of the anatomy, vessels, and nerves to prevent any undue damage. Blunt and sharp retractors are placed deep around the acetabulum (Schwarzkopf, 2014). The remaining labrum and osteophytes are removed. Sequential reaming of the acetabulum is performed to prepare for the acetabular implant. A cup is then implanted, and a screw may or may not be used for fixation. The appropriate liner is then inserted into the cup and impacted.

Femoral Exposure And Preparation

The retractors are removed and the foot of the bed is dropped 30° (Schwarzkopf, 2014). The ipsilateral leg is positioned in adduction and external rotation. Nursing will assist with replacement of retractors. A Hohmann retractor is placed inferolateral to the greater trochanter. A double-pronged retractor is placed posterior to the greater trochanter, between the external rotators and the capsule. A posterolateral capsular release is then carried out to provide visualization of the proximal femur. A

Mueller retractor is placed medially and a Hohmann retractor is placed lateral to the femur in order to expose the calcar region. The nonoperative leg is abducted to provide femoral exposure. To expose the surface of the femoral neck, the foot is externally rotated and adducted after extending the leg 30°–40° with no knee flexion. A Mueller retractor is placed behind the superior aspect of the greater trochanter. A bone hook is used to elevate the femur anterolateral by placing the bone hook inside the calcar region of the resected neck. A retractor is then placed medially in the calcar region, proximal to the iliopsoas tendon. A second retractor may be placed laterally at the proximal femur if desired. A rongeur or box osteotome is used to remove the bone in the superolateral region of the neck. Removing this bone helps minimize undersizing and various positions of the femoral broach and stem. A reverse cutting rasp is used to lateralize and open the femoral canal. The smallest broach is introduced into the canal, and broaching continues until the appropriate size is found. The final broach is maintained in place to complete trialing. Trialing is completed by using different head and neck trials. Trialing is performed until leg length, range of motion, and hip stability are satisfactory. The trials are then stopped, and the implant is introduced into the broached cavity and impacted into place. The head is secured onto the trunnion. Once the head is secured, the femoral head is relocated into the acetabular cup and the hip biomechanics are rechecked (Stryker Corporation, 2015). Fluoroscopic views are taken to verify appropriate placement, positioning, sizing, and alignment of the implants.

Wound Closure

The hip joint is copiously irrigated and debrided. The site is inspected for bleeding and cauterized if necessary. The wound is then closed in layers with a subcuticular closure and butterfly closures or Dermabond. Staples are not used because of potential irritation and wound breakdown in the hip flexor crease. The nursing staff will assist with wound closure and applying the appropriate sterile dressing.

Postoperative Care

Monitoring And Responsibilities of the Nurse

Postoperatively, the patient is transferred to the PACU. A typical patient will generally spend an hour or less in the PACU (Bigony, 2012). While in the PACU, the patient is monitored for heart rhythm and rate, blood pressure, temperature, and respirations. Evidence-based practice supports maintaining normothermia in surgical patients. Maintaining a normal temperature decreases the likelihood of surgical site infections (Hooper et al., 2010). The nursing staff may cover the patient with warm air units or hyperthermia blankets to help maintain normothermia.

Once the patient is admitted to the PACU, the nurse will place the patient on a cardiac monitor to observe vital signs. These vital signs will be closely monitored and compared with baseline values, as well as intraoperative vital signs. Vital signs are crucial in showcasing a patient's current medical status (Mok, Wang, & Liaw, 2015). It is essential for the nursing staff to assess vital signs consistently and accurately document them. Vital signs can elude the nursing staff to clinical worsening leading to subsequent adverse events. Variations in vital signs can be early indications of excessive blood loss or even myocardial injury.

The patient will also begin pain management in the PACU. Pain medication will usually be in an intravenous form. When administering these pain medications, the nurse must assess the patient for signs and symptoms of allergic reaction, respiratory depression, and effectiveness of the analgesic agent. Before being discharged from the PACU to the medical–surgical unit, the patient must meet discharge criteria. Discharge criteria can be scored using an Aldrete scoring system (Aldrete, 1995). The Aldrete scoring system assigns a numerical value to level of consciousness, activity, respirations, oxygen saturation, and circulation. For instance, a patient who can move all four extremities will receive a score of 2 in the activity-level category, a patient who can move only two extremities will receive a score of 1, and the patient who cannot move at all will receive a score of zero. Patients who have an Aldrete score greater than 8 with no zeros are able to be admitted to the medical–surgical unit.

The Nursing Unit

Once the patient reaches the medical–surgical unit, nursing care begins with a complete head to toe assessment. The nursing staff will continue to monitor vital signs including pain. Maintaining safety will be stressed to the patient, and the patient will be encouraged to use his or her call bell at all times. Patients will be encouraged to wash their hands frequently, their medications will be reviewed, and the patients will be encouraged to get up out of the bed the evening of surgery. Pain management and the different methods of pain control will be reviewed with the patient. The nursing staff is responsible for encouraging patients to perform leg exercises in and out of the bed. An individualized plan of care will be created by the nurse in concert with the patient. This plan of care will include a multidisciplinary team comprising of physical and occupational therapists, dietitian, case manager, respiratory therapist, chaplain, orthopaedic surgeon, and of course the nursing team. The nurse will review the patient pathway, outlining goals for each day regarding diet, activity, treatments, medications, and educational topics. The nurse–patient team will take the appropriate measures to prevent complications after surgery such as applying compression stockings, using the incentive spirometer, and taking medications as ordered.

Patient Education

Discharge education starts the minute the patient reaches the medical–surgical floor. Patient education can begin with a family member or once the patient is alert and oriented after surgery. The goal of a nursing discharge education should be to provide a discharge plan that meets the individual's needs, restores function, and, most importantly, improves the patient's quality of life. Nursing instructions on incisional care, pain management, and exercise are ongoing during the patient's hospital stay.

Patient's discharge educational needs may include physical therapy, follow-up appointments, medication adherence, the healing process, preventing and managing complications, exercises to continue at home, daily activities of self-care, and many other individualized needs.

Summary

The DAA to hip arthroplasty provides the patient with many favorable outcomes including shorter hospital stay, earlier mobility and functionality, decreased medical costs, and increased patient satisfaction scores. Appropriate nursing care of these patients begins with preoperative procedures including patient selection, preadmission testing, CHG bathing education, and MRSA and MSSA testing. It is essential for those patients at high risk for infection to be identified and treated accordingly. Nursing education to the patient and the family may include hand hygiene and the DAA to hip arthroplasty. During intraoperative care, the nurse may take on many different roles from setting up the room to being a patient advocate. Registered nurses are involved with anesthesia, positioning of the patient, prepping and draping, surgical assistance, and wound closure. After the surgery is completed, the registered nurse will take on the role of recovery nurse. In the immediate postoperative period, the nurse is responsible for monitoring vital signs, incisional drainage, pain, activity tolerance of extremities, consciousness, and oxygen saturation level. Providing patient-centered discharge education is a vital nursing role that will ensure and enhance the patient's recovery.

When preparing and caring for the patient who is having a DAA to THA, it is ideal to have a well thought-out plan. The nurse is an essential part in the care of these patients. Through all aspects of the patient's stay, nursing is involved. A successful outcome can be attributed to the care that registered nurses give these patients.

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ERRATA

Orthopaedic Nurses—Pioneers in Care Management: Erratum

In the January/February 2017 issue of *Orthopaedic Nursing* in the Guest Editorial by Brenda Luther, Brenda's title was misstated as "ONCB President." It should have been listed as Associate Professor, University of Utah College of Nursing.

REFERENCE

Luther, B. (2017). Orthopaedic nurses—pioneers in care management. *Orthopaedic Nursing*, *36*(1), 3–4.

Nursing Care Management: Influence on Bundled Payments: Erratum

In the January/February 2017 issue of *Orthopaedic Nursing* in the article by Lentz & Luther, "Nursing Care Management: Influence on Bundled Payments," Brenda's title was misstated as "Assistant Professor." It should have been listed as Associate Professor, University of Utah, College of Nursing.

REFERENCE

Lentz, S. & Luther, B. (2017). Nursing care management: Influence on bundled payments. *Orthopaedic Nursing*, *36*(1), 28–33.

Implementation of a Pediatric Orthopaedic Bundle to Reduce Surgical Site Infections: Erratum

In the January/February 2017 issue of *Orthopaedic Nursing* in the article by Schriefer et al., "Implementation of a Pediatric Orthopaedic Bundle to Reduce Surgical Site Infections," an author's name was omitted. Suzanne Hilt, RN, MSN, CPNP, should have been listed as the second coauthor. Suzanne is a Nurse Practitioner, Pediatric Orthopedics, at University of Rochester Medical Center, Rochester, New York.

REFERENCE

Schriefer, J., Sanders, J., Michels, J., Wolcott, K., Ruddy, C., & Hanson, J. (2017). Implementation of a pediatric orthopaedic bundle to reduce surgical site infections. *Orthopaedic Nursing*, *36*(1), 49–59.