A Teamwork Approach to Quality Patient Care in the Operating Room

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Editor's Note: *During a previous AST national conference in New Orleans, Betty Schultz, RN, who was then president of AORN, discussed patient safety and how collaboration between professionals in the circulating and scrub roles have the potential to enhance the goal of quality patient care.*

This led to the idea of an article co-authored by a CNOR and a CST that would demonstrate how the two surgical team members perform independently, but interact mutually to ensure a safe patient outcome.

The resulting article focuses on collaboration. Much of the introductory information may appear as a review for many practitioners, but it is included to address the distinct perspectives of the two professions.

Both authors believed that the case-study format would most effectively illustrate the roles of the CNOR and CST within the context of patient safety. The reference material was selected from multiple sites that are relevant to both professions.

This article also serves to introduce a new patient care model called CARE, which melds the A-PIE model familiar to nurses and the A POSitive Care approach familiar to surgical technologists and published in the AST-written textbook, Surgical Technology for the Surgical Technologist.

INTRODUCTION

In today's operating room, the surgical team, composed of both professional and paraprofessional members, plays a vital role in the successful outcome of any surgical intervention. The teamwork model of integrated function and interaction is the foundational basis that fosters a blending of the strengths of the various team members as they come together and work as a unit in the operative setting.

It is the synergy of this team—each with their own professional knowledge, skills and behaviors—that provides the structure and environment that assure the delivery of safe patient care and enable the patient's return to an optimum level of wellness.

The Registered Nurse and the Certified Surgical Technologist function as a subunit within this team, interacting through the utilization of a unique, dynamic relationship—that of four hands and two minds, one sterile role and one nonsterile role, working in interdependent collaboration, cooperation, and mutual support to manage the complexities of the highly technical, specialized operating room environment and to deliver safe patient care.

Using the context of the patient undergoing vaginal hysterectomy, this article will highlight the roles and interactions of these two members of the surgical team—the circulator and the scrub.

ROLES OF THE SURGICAL TEAM MEMBERS

The circulator role is primarily filled by the Registered Nurse (RN). Certification by the Competency and Credentialing Institute (CCI) as a Certified Nurse Operating Room (CNOR) is the preferred credential for those individuals practicing in the capacity of circulator.

The CARE model involves collaboration by all members of the surgical team in delivering patient-focused care.

The focus of the circulating role is one of patient assessment, safety and advocacy, as well as the technical skills of operating room management. In many facilities, the circulator is assisted by the Certified Surgical Technologist in delivering safe patient care outside the sterile field and in performing the technical skills of the operating room that fall within their scope of practice.

The scrub role is primarily filled by the Certified Surgical Technologist (CST). National certification by the National Board of Surgical Technology and Surgical Assisting (NBSTSA) as a Certified Surgical Technologist is the preferred credential for individuals practicing in this role. The focus of the scrub role is one of management of the sterile field.

The roles of both the circulator and the scrub are complex and involve an interdisciplinary approach toward:

- Care of the patient and surgical team members
- Application of the principles of asepsis and implementation of the practice of sterile technique
- Awareness of the environment
- Knowledge of normal regional anatomy and physiology
- An understanding of the pathophysiology related to the planned surgical intervention
- Knowledge of the operative procedure and its variations
- Identification and management of variations that may be specific to the patient (eg, size or comorbid conditions) or surgeon

CRITICAL THINKING MODELS IN THE OPERATIVE SETTING

The day-to-day delivery of quality patient care is one of the most important responsibilities and duties of the surgical team members. It is important that this patient care be delivered based on a collaborative utilization of critical thinking models.

One model—the A-PIE model, derived from the work of Ida Jean Orlando—is a nursing-process model based on the concepts of Assessment, Planning, Intervention, and Evaluation.

A second model, utilized by the surgical technologist—the A POSitive CARE model, derived from the work of Bob Caruthers, CST, PhD, focuses on the technical aspects of patient care. The acronym A POSitive CARE represents knowledge of Anatomy, Pathology, the Operative procedure and its Specific variations, while keeping in mind the Care directed toward the patient and/or team, Aseptic principles and sterile technique, the Role of the team members, and Environmental awareness and concern.

A third model, the CARE model, was developed by the authors of this article. The CARE model embraces the essence of both the A-PIE and A POSitive CARE models and provides a common pathway for interaction among surgical team members.

THE CARE MODEL OF COLLABORATIVE SURGICAL PATIENT CARE

The CARE model is an integrated model of patient care practice that includes active participation and collaboration by all members of the surgical team. It integrates and shows the primary relationship between the roles of tech and circulator in the provision of patient-focused care throughout the intraoperative period.

It includes the concepts of Communication, Assessment, Recommended standards and guidelines, and the Execution of policies and procedures. This model is simple to remember, demonstrates an interdependent relationship among the various practitioners as they perform their duties and execute their responsibilities, and can easily be utilized by any member of the surgical team to prepare for and carry out the various components involved in the delivery of quality patient care.

COMMUNICATION

During a surgical intervention, the circulator and scrub must work together as a unit, in a manner that emulates the true meaning of the word "team." This intraoperative team carries out the myriad tasks and activities that assure the most positive patient outcome possible.

Interaction occurs before, during, and after patient contact to assure that the instrumentation, supplies, equipment and specialty items are gathered, prepared and delivered to the surgeon and assistant in a timely and efficient manner—minimizing the patient's exposure to anesthesia and surgical trauma. Effective teamwork requires planning and utilization of strategies that allow smooth, uninterrupted performance of each individual's tasks and responsibilities.

One key to the success of any team is the use of positive communication. In light of the fact that this intimate subunit must rely upon each other for follow-through of many aspects of a related task, positive communication becomes the linchpin that binds the team into a single functioning unit.

A close-knit intraoperative team communicates on many levels, both verbally and, more often, nonverbally. The circulator assesses the patient's unique needs and develops an individualized plan of care. This care plan is shared with the scrub, including patient allergies, patient limitations and any additional information, such as patient size, that may affect procedural activities.

The circulator performs ongoing patient and sterile field monitoring, anticipating and delivering needed items in a manner that permits the procedure to flow smoothly and without interruption. The scrub monitors the sterile field, the surgical team and the unfolding events of the surgical intervention—sharing observations and special requests with the circulator in a timely manner, which enables them to work together in meeting the surgeon's and patient's needs.

Communication not only occurs between the scrub and circulator, it also involves sharing information among other team members, the patient and any other caregivers who are able to provide additional information and input needed to develop a clear picture of the many patient variables that may influence their intraoperative care.

Admitting personnel and staff gather knowledge and assess the patient, documenting information that plays a vital role in addressing the unique needs of each and every patient.

As the circulator and anesthesia provider assess the patient's individual needs, it is important that any information that affects surgical intervention be shared among all members.

The surgeon is an integral part of this communication team. He or she best knows the patient's chief complaint and has had the opportunity to discuss individual patient concerns relevant to their biopsychosocial needs. By communicating this information to the intraoperative team, the surgeon can be assured that both the routine and specialty items required for the procedure are prepared in a timely and professional manner.

Communication with the anesthesia provider allows for a smooth and seamless anesthesia induction, maintenance and recovery, along with maintenance of physiological homeostasis.

ASSESSMENT

Assessment, the art of gathering information used to develop a plan of action, is the second key to a successful patient outcome and begins at the time the procedure is scheduled.

Many operating rooms now have the ability to utilize and access computerized patient information. This enhanced technology allows the surgeon to forward procedural and patient-specific information and requests directly to the intraoperative team. This information may include the laterality of the procedure, the use of a trial supply or piece of equipment, patient allergies, such as latex sensitivity, or the need for ancillary personnel not commonly utilized.

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Gone are the days when the surgeon was solely responsible for the actions of the team. Today, nurses and surgical technologists are formally educated in skills, knowledge, patient safety and risk management.

Knowing this information in advance of the patient's arrival in the operating suite permits the team to optimize preparation, resulting in optimal levels of preparedness and remediation of any situation that may lead to or result in a disruption or delay in the surgical intervention.

Assessment is divided into two areas: procedure-specific information and patient-specific information:

Procedure-specific information

The surgeon's preference card is a valuable tool when gathering data related to a specific procedure and surgeon. It contains listings of routine instruments, supplies, wound closure materials, and equipment commonly used by a particular surgeon during a particular procedure. Patient position and positioning aides, skin preparation materials and techniques, surgeon's glove size and other details are contained on a well-developed and maintained card. It is important for the intraoperative team to assure that the surgeon's preference card is current and accurate, allowing all members of the surgical staff to correctly prepare for each procedure.

Procedure-specific preparation also involves assuring that specialty items, such as mesh for herniorrhaphy, prostheses for orthopedic procedures, and limited-inventory equipment, such as a microscope or stirrups for lithotomy positioning, are available. Emergency cases, unanticipated equipment failures and back-ordered inventory can lead to the staff's inability to provided necessary equipment for patient use.

Once the patient is anesthetized, discovering that needed equipment or items are not available is unproductive, inappropriate and unprofessional. Prospective management of these types of situations through anticipation, planning and effective communication can prevent the need to delay or cancel a surgical intervention—a situation that can be stressful to both the surgeon and patient.

Assessment also involves procedure-specific operating room preparation. During the initial daily room preparation, it is important that equipment, such as lights, suction and the electrosurgical generator, be checked to assure that they are in proper working order.

The same is true for any specialty equipment brought into the room for use on a specific case. It is the responsibility of the intraoperative team to review the case cart and compare it to the patient's record and surgeon's preference card to determine that all requested items are present or immediately available.

Patient-specific information

Every patient who comes to the operating room brings with him or her unique needs and requirements. The operative experience may become routine for operating room practitioners, but it is important that the patient not be defined merely as a room number, diagnosis or procedure. When we refer to patients by their intended procedure, it diminishes the value of each life that is entrusted into our care during this most critical time.

The biopsychosocial needs of each patient play an important role in their overall successful return to their optimum level of wellness. Information that has the potential to impact patient care, such as coexisting medical conditions and patient allergies, should be shared with all individuals caring for this patient.

Patient-specific information may be gathered from other members of the care team (such as the physician and personnel in the admissions or preoperative holding areas), family members or life partners, the patient's medical records, and of course, directly from the patient.

As the circulator and anesthesia provider assess the patient's individual needs, it is important that any information that affects surgical intervention be shared among all members. Patient anxiety level, allergy status, fear of certain items or noises, the need for the presence of a family member or partner for psychological support, the request for omission of a certain aspect of care, such as blood transfusions, are all issues that should be monitored and maintained by all members of the intraoperative team.

Patient anxiety affects their care by releasing cortisol and stimulating the "fight or flight" reaction. This leaves a patient less able to fight infection and may negatively impact postoperative wound healing.

Developing a trusting and supportive relationship between patients and their caregivers should include anxiety-reducing practices, such as introducing all members of the surgical team to the patient, focusing on the patient and the patient's needs, assuring patient safety and well-being by providing physical and verbal comfort, applying warm blankets, and using patient safety devices, such as safety straps.

If possible, the scrub should refrain from making loud or unnecessary noise, requesting supplies, or performing surgical counts in the presence of the awake patient. These activities distract the circulator from providing direct patient care and tend to create an environment that generally increases patient anxiety levels.

Information pertaining to the patient's height or weight is also important. It may be necessary to modify the type, length or size of the instruments and/or the suture routine, based on this information.

RECOMMENDED STANDARDS AND GUIDELINES

A third key to a successful patient outcome is recognizing and following recommended standards of practice and guidelines. Several important groups provide input and maintain standards of practice that affect operating room practice, including the Association of periOperative Nurses (AORN), the Association of Surgical Technologists (AST), the American College of Surgeons (ACS), the American Hospital Association (AHA), the Association

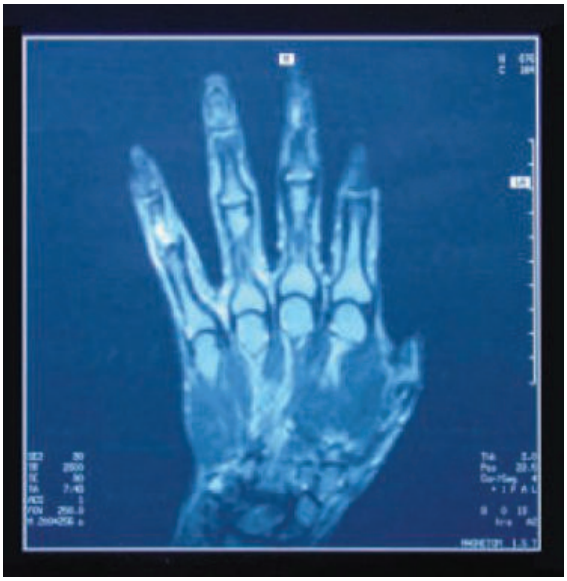
We have an obligation to our patients to account for all items prior to final closure of a body cavity.

for the Advancement of Medical Instrumentation (AAMI), and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

The standards of practice and guidelines of these groups, along with several others, provide insight into, and serve as a framework for, the delivery of quality, safe patient care. These documents provide a foundation upon which quality surgical patient care is based. The topics covered represent literally every aspect of operating room practice, from attire to sterilization, disinfection and standards of care.

While recommended standards serve as a guide for practice, they are developed and based on research, input and data collected from across the country. They are the standards to which the community holds the intraoperative team responsible.

When we refer to patients by their intended procedure, it diminishes the value of each life entrusted into our care.



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When in clinical practice, the intraoperative team utilizes the principles of these standards, recommended practices and guidelines to aid in decision-making and the implementation of care. Use of these principles assures the practitioner that their decisions are professional, sound, research-based and designed to provide the surgical patient with an optimal outcome.

EXECUTION OF POLICIES AND PROCEDURES

Execution of the patient's care plan, based on the recommended standards and guidelines, represents the fourth key to the CARE model for successful patient outcome. As the operative procedure is carried out, each team member is responsible for assuring that the needs of the patient and the team are met in a timely and thorough manner and with quality and integrity. Each member, while assessing their own domain of function and contributing their ideas and thoughts, needs to work collaboratively to prevent redundancy and to promote successful, competent and professional care delivery.

DELIVERING QUALITY PATIENT CARE

Easy to remember and use, the CARE model can serve as a reference point to ensuring that quality patient care is delivered each and every time. Application of this model, supported by examples referencing the standards of practice from a variety of professional organizations and industry leaders related to operating room practice, is exemplified using the following scenario.

CASE STUDY

A 32-year-old female, gravida 5, para 5, is scheduled to undergo vaginal hysterectomy due to second-degree uterine prolapse. Her medical history is unremarkable, with the exception of morbid obesity. Her social history includes the statement that both parents are deceased; her mother from a cerebrovascular accident at the age of 54 and her father from lung cancer at the age of 59.

She is married, with five children, ranging in age from four to 16. She works in a manufacturing plant on the assembly line. She smokes two packs of cigarettes per day and consumes one to two cans of beer daily. Her current medications include oral contraceptives, and she has no known drug allergies. Her admission data includes the following statistics:

- Height—5'3"
- Weight—354 pounds

ADMISSION VITAL SIGNS

- Blood pressure—146/85
- Pulse—88 bpm
- Respirations—20/min
- Temperature—97.6° F

ANATOMY, PHYSIOLOGY, AND PATHOPHYSIOLOGY OF THE FEMALE REPRODUCTIVE SYSTEM

The internal reproductive organs of the female include the uterus, ovaries, and fallopian tubes. The ovaries are both exocrine and endocrine glands, producing the hormones estrogen and progesterone, inhibitin, and relaxin, as well as storing and releasing mature ova during the course of the reproductive years. The fallopian tubes serve as a conduit for the capture and transportation of ova from the ovary to the uterus.

The uterus is a pear-shaped organ, located between the bladder and the rectum in the pelvic cavity, consisting of three layers—the endometrium, or lining; the myometrium, or muscle layer; and the perimetrium, which is part of the visceral peritoneum. The uterus is divided into several sections: the dome-shaped portion located above the fallopian tubes, referred to as the dome or fundus; the central section, called the body or corpus; and the inferior, narrow portion that controls entrance into the uterine cavity from the vagina, the cervix.

The uterus receives an ample blood supply from the uterine arteries, which are branches of the internal iliac arteries. Blood leaving the uterus returns to the internal iliac veins via the uterine veins. The uterus is the site of menstruation, implantation and development of a fertilized ovum, and labor.

The uterus is suspended in the pelvic cavity by a series of paired ligaments. The broad ligaments are double-folds of peritoneum that attach the superior segment of the uterus to the sidewalls of the pelvis. The uterosacral ligaments connect the posterior neck of the uterus to the sacrum. The cardinal ligaments extend from the broad ligaments and connect the cervix and vagina to the pelvic wall. The round ligaments extend from the uterus to the labia majora via the inguinal canal.

Uterine prolapse, or descensus, is a condition of laxity of the uterine suspensory ligaments. In first-degree prolapse, this laxity permits the cervix to be displaced downward into the vagina to the level of the vaginal introitus.

In second-degree prolapse, the cervix is displaced downward to a point where the cervix passes through the introitus and is exposed to the outside environment. In third-degree prolapse, the uterine body is displaced downward to a point where it can be seen outside the introitus.

Exposure of the vaginal mucosa to the outside environment can lead to erosion of the vaginal mucosa, ulceration and infection. In its displacement, the uterus may also pull on the posterior wall of the bladder, resulting in a bladder neck malposition that can result in urinary incontinence and chronic urinary tract infection.

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During a surgical intervention, the circulator and tech must work together as a unit, in a manner that emulates the true meaning of the word "team."

PROCEDURAL OVERVIEW

Vaginal hysterectomy involves the removal of the entire uterus, including fundus, corpus and cervix via a vaginal approach. Following injection of a hemostatic agent, such as vasopressin or epinephrine, into the vaginal cuff, an incision is made around the periphery of the cervix.

Uterine clamps, such as Kocher, Phaneuf, or Heaney clamps are used to secure the uterine body pedicles during division and ligation of the uterine ligaments and vessels with size zero absorbable suture material. The ovaries and fallopian tubes also may be removed via this approach, but are commonly left in place so that the ovaries may continue providing adequate levels of estrogen and progesterone throughout the patient's life cycle. The vaginal cuff is then closed with absorbable suture material to prevent intestinal prolapse.

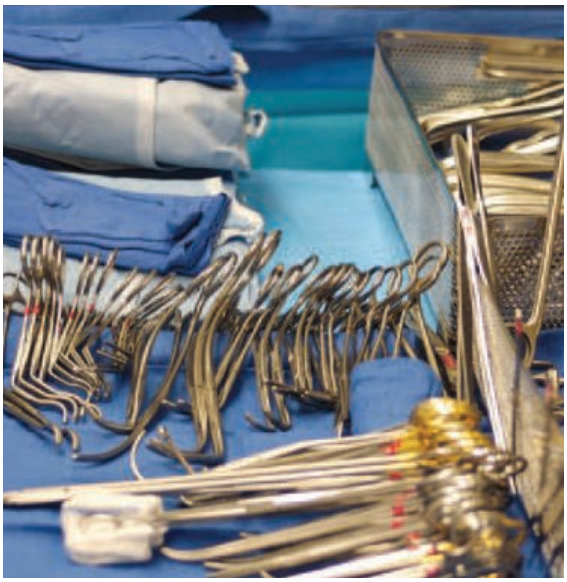
Working through the restricted space of the vagina can be challenging. Vaginal hysterectomy is the procedure of choice for the diagnosis of

uterine prolapse, or descensus, since the supporting ligaments of the pelvic floor are sufficiently relaxed to permit manipulation of the reproductive tissues using this approach. In addition, the patient's return to wellness is usually hastened by not having to address the issues and concerns that can accompany an abdominal incision.

POSITIONING

Vaginal hysterectomy involves placement of the patient in the lithotomy position, a position associated with inherent dangers and risks. The circulator and scrub must be familiar with these risks and must plan appropriate interventions based on both knowledge of the position and intervening patient factors.

Following recommended standards of practice assures the practitioners that their actions are professional, sound and research-based.



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LITHOTOMY POSITION

The lithotomy position permits access to the perineum and rectum by stabilizing the patient's legs away from the surgical site. A modification of the dorsal recumbent position, the lithotomy position uses stirrups for positioning of the lower extremities. Three types of stirrups are available: knee-crutch stirrups, candy cane or string stirrups, and boot-type stirrups.

For long procedures, such as a vaginal hysterectomy, the boot-type stirrup is the preferred positioning aid for the lower extremities. This stirrup is designed to support the lower extremity by placing the foot and calf into a boot device. The boot is attached to an arm that can be repositioned intraoperatively by the surgeon, providing support with a minimum of circulatory and vascular compromise of the extremity. The stirrup arms are attached to the siderails of the operating table using universal socket adaptors, and preliminary height and length adjustments are made.

Prior to placement of the patient on the operating table, the table is prepared in the following manner. The head segment is removed from its normal location at the head of the table, placed onto the foot section, and secured. If necessary, the Bakelite cassettes (X-ray boards) of the table are removed.

The sheet and draw sheet are placed, and an absorbent pad may be added over the perineal cutout of the table's buttocks section. To expedite the positioning process, all necessary positioning devices and padding should be assembled prior to the patient's entry into the operating room.

The patient is initially placed in the supine position, so that the sacral area of the pelvis is positioned over the perineal cutout on the operating table. Care is taken that the patient is positioned correctly, allowing self-retaining vaginal retractors to be utilized, while preventing sacral strain from hyperextension and over-rotation of the hip joint. A patient safety strap is applied over the thigh area during anesthesia induction and emergence.

The hands and arms should be positioned on bilateral armboards to prevent accidental entrapment of fingers in the foot section of the operating table as this section is raised or lowered. The armboards are positioned at an angle less than 90° to prevent brachial plexus injury. The elbows are padded, and the arms are placed with the palms facing upward to prevent ulnar nerve injury. Alternatively, the hands and arms may be placed over the patient's abdominal area, if they do not interfere with respiratory effort.

To prevent electrical injury, the patient's body should not be permitted to contact any metal portion of the operating room table. The patient is anesthetized, and the eyes are lubricated and secured in the closed position to prevent corneal drying and abrasion. Antiembolic devices, such as antiembolitic stockings or sequential com-

pression devices, are commonly applied to the lower extremities to prevent venous stasis that could lead to deep vein thrombosis.

Once permission to move the patient is obtained from the anesthesia provider, the safety strap is removed, and the legs are manipulated slowly and simultaneously by two nonsterile surgical team members to prevent hyperextension of one leg, which could result in sacral nerve damage. While supporting the foot in one hand and the calf with the other, the legs are positioned in the boot with the hips flexed and the legs abducted and externally rotated, exposing the perineum and vaginal introitus.

The boots must be properly positioned and well padded to prevent peroneal nerve damage, due to pressure on the peroneal nerve in the popliteal space. Any final height and length adjustments are made to the stirrups. The head segment is removed from the foot of the table, and the leg section of the table is lowered as far as possible.

TRENDELENBURG'S POSITION

Trendelenburg's position may accompany the lithotomy position to displace the abdominopelvic organs away from the operative site to allow better visualization, reduce blood flow to the pelvis, and promote venous drainage. Cardiovascular and respiratory compromise, blood pressure changes, and patient movement toward the head of the operating table are potential hazards to the patient in this position. Precautionary and interventive measures to prevent patient movement include decreasing the angle of the operating table, utilizing padded shoulder braces, moving the operating table slowly, and returning the patient to the level position as soon as possible.

At the end of the surgical intervention, the leg section of the table is raised, and the head segment is reattached to the foot of the table. Permission to move the patient is obtained before both legs are returned to the dorsal recumbent position simultaneously and slowly, permitting the patient's hemodynamic status to remain within normal limits. A rapid lowering of the legs may induce a hypotensive episode, especially in the hemodynamically challenged patient. (See Tables 1A and 1B.)

Table 1A Overview of AORN Recommended Practices for Positioning the Patient in the Perioperative Practice Setting

- Preoperative assessment for positioning needs should be made before transferring the patient to the procedure bed.
- Positioning devices should be readily available, clean, and in proper working order before placing the patient on the procedure bed.
- The number of personnel and/or devices should be adequate to safely transfer and/or position the patient.
- Maintaining the patient's correct body alignment and supporting extremities and joints decreases the potential for injury during transfer and positioning.
- After repositioning or any movement of the patient, bed, or devices that attach to the procedure bed, the patient should be reassessed for body alignment.

Table 1B Injury Risks and Safety Considerations When Positioning Patients—Lithotomy

- Hip and knee joint injury
- Lumbar and sacral pressure
- Vascular congestion
- Neuropathy of obturator nerves, saphenous nerves, femoral nerves, common peroneal nerves and ulnar nerves
- Restricted diaphragmatic movement - pulmonary region
- Place stirrups at even height
- Elevate and lower legs slowly and simultaneously from stirrups
- Maintain minimal external rotation of hips
- Pad lateral or posterior knees and ankles to prevent pressure and contact with metal surface
- Keep arms away from chest to facilitate respiration
- Arms on armboards at less than 90-degree angle or over abdomen

MEDICATIONS

The female reproductive organs and associated structures have an ample blood supply. The uterine arteries arise directly off the internal iliac arteries, resulting in the potential for brisk, intraoperative bleeding. The vagina provides limited access to the pelvic tissues, and any bleeding that occurs can impair visualization of important structures.

Chemical hemostasis is the method of choice to both minimize blood loss and permit optimal visualization in the surgical field. This becomes even more critical when dealing with the morbidly obese patient, where visualization may already be compromised due to limited exposure of the perineum obtained from positioning.

Vasopressin, a vasoconstricting agent commonly used in a 0.67-units/ml solution, is inject-

ed into the vaginal cuff at the level of the cervix prior to the incision. When vasopressin is injected into tissues, a rise in systemic blood pressure is commonly observed. If vasopressin is injected systemically, via direct delivery into a blood vessel, systemic hypertension or hypertensive crisis can result, placing the patient at risk for cerebrovascular accident (CVA).

When using any medication in the operating room setting, safety guidelines for the handling of medications should be followed. Both the scrub and the circulator should verify the medication's name, expiration date, and strength or concentration. Once the medication is transferred to the sterile field, all containers that the medication is placed into must be appropriately labeled with the medication's name and concentration.

Table 2 JCAHO 2005 Critical Access Hospital Standards—Medication Management

COP Standard MM.-4.30 (TX3.2)

- Standard: Medications are appropriately labeled.
- Rationale: A standardized method for labeling all medications will minimize errors.
- Elements:
  - Medications are labeled in a standardized manner according to critical access hospital policy, applicable law and regulation, and standards of practice.
  - At a minimum, all medications are labeled with the following:
    - Drug name, strength, amount (if not apparent from the container)
    - Expiration date when not used within 24 hours
    - Expiration time when expiration occurs in less than 24 hours
    - For all compounded IV admixtures and parenteral nutrition solutions, the date prepared and the diluent

When the medication is handed to the surgeon, the name and concentration should be stated, even if this is the only medication on the sterile field. Just prior to injection and again once the injection is completed, the overall dosage delivered should be shared with the anesthesia provider, so that he or she may adjust the levels of anesthetics and monitor the patient closely for adverse medication effects.

The dosage should be reported to the circulator, too, so that accurate and thorough documentation of medication usage may be completed. These safeguards permit the safe and accurate delivery of medication to the patient. (See Table 2.)

HAZARDOUS EQUIPMENT

ESU

Technology in the operating room lets us "live better electrically" with the electrosurgical unit (ESU) having become a standard part of most surgical interventions. The ability to easily control superficial bleeding intraoperatively, though, does not come without hazards, particularly fire and electrical injury.

The activated electrosurgical pencil adds one of the three principal components of fire—that of ignition or a heat source. Combined with flammable, disposable drapes, gauze sponges and preparation solutions, and fueled by the oxygen-rich environment of the surgical suite, ESU use can instantaneously change from the role of lifesaver to that of dangerous foe.

Many safeguards have been added to the use of electrosurgical technique to safeguard the patient from inadvertent injury, but many of these safeguards depend on human intervention to assure their ability to prevent injury. These interventions include the proper use and placement of the patient-return electrode and the use of the safety holster to prevent inadvertent activation of the hand-switching active electrode.

METHANE GAS

A hazard commonly overlooked when performing rectovaginal surgery is the potential for the ignition of methane gas, a flammable gas produced during the digestive process and stored in the large intestine. Should this gas be expelled during ESU activation, ignition can cause a burn to the perineum, especially in the presence of pubic hair and flammable (alcohol-based) prep solutions. Care should be taken to prevent gas evacuation by using a moistened gauze sponge to pack the rectum intraoperatively and limiting use of the ESU active electrode during periods when the patient is coughing or "bucking."

PATIENT-RETURN ELECTRODE

The manufacturer's recommended guidelines for use should always be followed when selecting a proper site for return electrode (pad) placement. An area that contains a large underlying muscle

mass provides an optimal site for pad placement. Conditions such as excessive underlying scar or thick adipose tissue, underlying metal implants or bony prominences make alternative site selection a must.

Excessive hair requires removal prior to pad placement in order to assure good contact between the skin and the electrode. A site close to the surgical incision and one closer to the incision than other potential alternative sites for ground should be selected for optimum pad placement.

Preventing alternative pathways to ground is equally important. No part of the patient, especially hands and fingers, should be in direct contact with the metal surfaces of the operating table.

SAFETY HOLSTER

Each disposable, hand-activated electrosurgical pencil comes with a disposable holster in which to store the active electrode when not in contact with the patient. Like any new behavioral pattern, holster use requires diligent monitoring and promotion of its use.

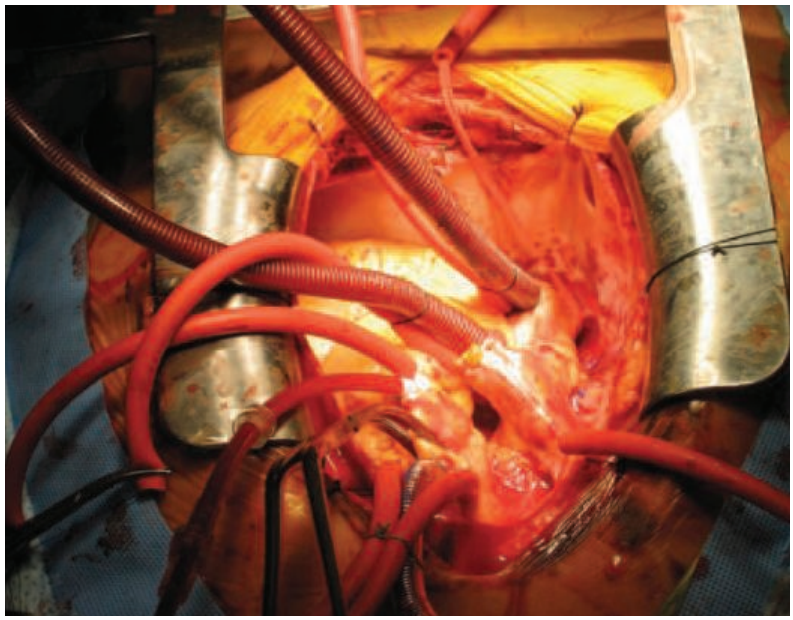
Table 3 Overview of OR Safety Precautions Related to Electrosurgery–Valley Lab, Inc

- The ESU should not be used in the presence of flammable agents (ie, alcohol and/or tincture-based agents)
- Avoid oxygen-enriched environments
- Use of a nonconductive holster is recommended by ECRI, Los Angeles Fire Marshall, AORN
- Do NOT use red rubber catheters or other materials as a sheath on active electrodes.
- Radiofrequency is not always confined by insulation. Current leakage does occur. It is recommended that cords not be wrapped around metal instruments or bundled together.

Positioning of the holster in such a manner that is conducive for the surgeon to secure the pencil will encourage routine usage and, perhaps, prevent an iatrogenic patient injury. Positive communication skills among team members will aid in developing and reinforcing this skill pattern. (See Table 3.)

RETAINED FOREIGN ITEMS

Gone are the days of "The Captain of the Ship," when the surgeon was totally and solely responsible for the actions of himself and the operative team providing patient care. Today, nurses and surgical technologists are formally educated, not only in the skills, knowledge, and behaviors of their professions, but also in patient safety and risk management.



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A retained foreign item left in a patient can be devastating for the operating room professional.

Under the doctrine of *Res ipsa loquitor* ("The thing speaks for itself"), leaving an unintended foreign item inside a patient body cavity can have life-impacting consequences, not only for the patient, but for the members of the operating team as well.

The physical and physiological pain of undergoing additional surgery, as well as the potential injury to tissues and organs, compel the operating room team to assure that all unintended foreign items are removed from body cavities prior to closure of those cavities. While the likelihood of misplacing a surgical instrument in the pelvic cavity during vaginal hysterectomy is not as likely as it would be for open abdominal procedures, the potential still exists, in addition to the risk of bending or breaking surgical needles and unintentionally failing to remove a bloodied packing sponge.

As professionals, we have an obligation to our patients to account for all items prior to the final closure of a body cavity. Performing audible counts with both members of the intraoperative team—visualizing and recording each item as it is counted—provides the best assurance that these items will not become a problematic issue for the patient or the surgical team.

A retained foreign item left in a patient can be devastating for the operating room professional. The idea that a patient was directly harmed by one's actions can leave staff members with a sense of failure and low self-esteem. The trauma of defending one's professional knowledge and skills in a court of law can result in individuals leaving the profession for less demanding and less stressful careers. (See Table 4.)

Table 4 Overview of AORN Recommended Practices for Sponge, Sharp, and Instrument Counts

- Sponges should be counted on all procedures in which the possibility exists that a sponge could be retained.
- Sharps and miscellaneous items should be counted on all procedures.
- Instruments should be counted on all procedures in which the likelihood exists that an instrument could be retained.
- Sponge, sharp, and instrument counts should be documented on the patient's intraoperative record.

Table 5 JCAHO Universal Protocol for Preventing Wrong Site, Wrong Procedure, Wrong Person Surgery

Preoperative Verification Process
Purpose: To ensure that all of the relevant documents and studies are available prior to the start of the procedure and that they have been reviewed and are consistent with each other and with the patient's expectations and with the team's understanding of the intended patient, procedure, site and, as applicable, any implants. Missing information or discrepancies must be addressed before starting the procedure.
Process: An ongoing process of information gathering and verification, beginning with the determination to do the procedure, continuing through all settings and interventions involved in the preoperative preparation of the patient, up to and including the "time-out" just before the start of the procedure.

Marking the Operative Site
Purpose: To identify unambiguously the intended site of incision and insertion
Process: For procedures involving right/left distinctions, multiple structures (such as fingers and toes), or multiple levels (as in spinal procedures), the intended site must be marked such that the mark will be visible after the patient has been prepped and draped.

"Time Out" Immediately Before Starting the Procedure
Purpose: To conduct a final verification of the correct patient, procedure, site, and as applicable, implants.
Process: Active communication among all members of the surgical/procedure team consistently initiated by a designated member of the team, conducted in a "fail-safe" mode, ie, the procedure is not started until any questions or concerns are resolved.

WRONG SITE SURGERY

In response to the public outcry related to report after report of incorrect surgical interventions performed on healthy tissues, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) published the Universal Protocol for Preventing Wrong Site, Wrong Procedure, Wrong Person Surgery.

This protocol mandates that policies and procedures be implemented to avoid the incidence of surgical procedures performed on the wrong patient or wrong tissue. (See Table 5.) All JCAHO-accredited institutions are required to comply with this protocol as a means of providing safe patient care.

One aspect of the protocol requires that a "time-out" be performed just before the beginning of the procedure or the skin incision. The protocol requires that active communication take place among all members of the surgical team.

In light of the nature of hysterectomy, where the final determination as to approach is sometimes made following a bimanual examination by the physician while the patient is under anesthesia and unable to mark the appropriate incision site, it is important that clear communication regarding the patient's desires and anticipated outcomes be made known prior to anesthesia induction.

CONCLUSION

The intraoperative team, composed of formally educated and credentialed CNORs and CSTs working together to deliver quality patient care, is a concept that needs to be adopted and implemented with the sole focus of making a positive impact on patient care and operative outcome.

The results of the actions, collaboration, and synergy of this team of experienced and knowl-

edgeable experts, along with surgeons, anesthesia providers and other support staff, set the stage for a positive, safe and successful patient outcome in today's challenging O.R. environment.

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The actions of the intraoperative team set the stage for successful patient outcomes in today's challenging O.R. environment.

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