Section 3.0

PERIOPERATIVE SERVICES

Evidence-Based Practice, Quality Improvement & Patient Safety Practices, and Document Strategies

Introduction

Perioperative services, including anesthesia, require a concerted effort to reduce risk and enhance patient safety. Multidisciplinary team members must unite to effectuate changes that promote patient safety and optimize patient outcomes. The focus of this chapter centers on risk and patient safety considerations during each phase of the perioperative experience. The knowledge and understanding gained from the contents and associated tools will allow risk management professionals, surgical clinical directors and medical staff members to proactively identify risks and initiate patient safety improvements.
Section 3.1

Proactive Risk & Patient Safety Practices

| Perioperative – Common Malpractice Allegations |

The following list includes the various types of allegations made against perioperative practitioners in medical malpractice cases:

- Lack of informed consent
- Inadequate cardiac and respiratory evaluation
- Inappropriate medical clearance
- Medical mismanagement, including, but not limited to, misdiagnosis, wrong procedure, unnecessary procedure
- Technical errors in the performance of a procedure
- Retained foreign bodies
- Patient identification errors
- Wrong-site/wrong-side surgery
- Failure to treat/diagnose deep venous thrombosis
- Hospital-acquired infection
- Equipment failure/malfunction
- Burns from laser, electrocautery or prep solution
- Surgical fires
- Circulatory or nerve impairment related to positioning
- Inadequate patient monitoring and assessment
- Failure to provide adequate discharge teaching

Allegations specific to perioperative nurses may include:

- Retained foreign bodies (needles and sponges)
- Burns from laser, electrocautery or prep solution
- Circulatory or nerve impairment related to positioning
- Inadequate patient monitoring and assessment
- Failure to provide discharge teaching

Perioperative – Claim Analysis, Contributing Factors

According to The Joint Commission’s sentinel event data, communication was the second most frequently identified root cause of sentinel events reviewed by The Joint Commission in 2013. Effective communication is a key component of several processes associated with the care of

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surgical patients during each perioperative phase. Examples of processes that rely on effective communication among perioperative team members include: hand-offs, time-outs, intra-operative counts, post-operative patient monitoring and discharge. These and other perioperative processes are explained in greater detail in Section 3.2.

Surgeons often face allegations of inadequate informed consent, as well as allegations regarding the performance of the surgery itself. Accordingly, it is important to regularly monitor informed consent documentation to ensure that all the necessary elements are present. Informed consent is discussed further in Section 3.2.

**Proactive Risk and Patient Safety Identification**

Proactive risk and patient safety practices for perioperative services begin with effective risk management, quality improvement and patient safety programs. The following sections include an overview of the components to be considered when developing or updating a perioperative services risk management program.

**Perioperative Risk Management Program Elements**

The recommended components of a perioperative risk management program include the following:

- Effective reporting of adverse events and near misses
- Active medical staff involvement in the identification of risk and in the implementation of risk treatments
- Protocols to manage high-risk patient care activities (e.g., patient identification, counts, positioning, use of equipment and supplies)
- A multidisciplinary patient care/quality review process which also addresses the quality and completeness of the medical record
- Ongoing evaluation of the environment to identify and address safety hazards and traffic control
- An equipment management plan that addresses acquisition, maintenance and repair
- Written policies and procedures to guide operation of the department
- Staff member orientation and educational programs
- Annual self-assessment of the perioperative area, with a summary of identified opportunities, analysis and actions to be taken
- A clear understanding of the clinical, business and operational risks of the department, based on the scope of services provided
Evidence-based healthcare has been defined as follows:

Evidence-based health care is the conscientious use of current best evidence in making decisions about the care of individual patients or the delivery of health services. Current best evidence is up-to-date information from relevant, valid research about the effects of different forms of health care, the potential for harm from exposure to particular agents, the accuracy of diagnostic tests, and the predictive power of prognostic factors.3

The Association of periOperative Registered Nurses (AORN) and the American College of Surgeons support a systematic approach to achieve exemplary practice in the delivery of care. The American College of Surgeons strives to support physicians by providing information through a systematic and integrated approach that includes the following:

- An accessible repository of available scientific evidence
- Available outcome studies that document the results of surgical care
- A process to introduce new technology and innovative practices
- A clinical trials program4

AORN encourages nurses to utilize a methodical approach to identify potential issues in clinical practices. Indeed:

AORN believes:

- Research should be the foundation for perioperative nursing practice.
- Evidence-based practice is fundamental to quality patient care.
- Incorporating research findings into perioperative nursing practice is a critical component of the continuing effort to improve patient outcomes.5

Establishing a multi-disciplinary practice committee requires the collaboration of the various disciplines (e.g., medical staff, nursing, anesthesia, pharmacy, risk management) that are involved in the provision of care and treatment of perioperative patients. A multi-disciplinary practice committee should be charged with overseeing the care that is provided in the perioperative department, while also performing at least the following functions:

- Developing evidence-based protocols, policies and/or procedures that are in compliance with the guidelines of professional organizations and licensure, regulatory and accreditation bodies
- Analyzing surgical and anesthesia clinical indicators and implementing action plans when needed
- Reviewing the pertinent literature when making clinical, business and/or operational decisions that may impact patient safety
- Ensuring that peer review takes place
High-reliability organizations conduct relatively error-free operations over long periods of time and consistently make good decisions. The following key elements are imperative to the successful development of a high-reliability organization:

- **Leadership** – Leaders work collaboratively with one another and are charged with creating the appropriate culture.
- **Institutional infrastructure, organizational alignment and resource investment** – The appropriate technology and information systems are implemented to facilitate a high-reliability organization.
- **Transparency** – Open communication across the organization is encouraged; successes, as well as failures, are recognized.
- **Accountability** – The responsibility for quality and patient safety initiatives and favorable outcomes extends from the unit level to the individual practitioner.
- **Rigorous measurement** – Data on clinical outcomes are gathered and analyzed to determine where to focus improvement efforts.\(^6\)

The perioperative unit must have well-established safety goals and evaluate these goals, taking into account the performance expectations of the unit and the organization as a whole. Perception of risk may be heightened by an evaluation of internal and external data. Staff member education is often needed to supplement knowledge deficits. Each perioperative unit needs its own plan for increasing knowledge regarding risk, quality and safety management within the perioperative environment. For example, the perioperative department may have regular reviews of risk issues pertaining to surgical medication safety or special patient issues that might differ from issues identified in other units. Each unit must develop policies, procedures, training programs and redundant systems that are specific to known risk areas for that particular unit and still function within the global rules of high-reliability for the organization. Additional unit-based options to ensure high-reliability may include:

- **Unit-based safety rounds asking:**
  - What have staff members seen today that caused harm?
  - What have staff members seen that could have caused harm?
  - What have staff members done to prevent harm?
- **Regular feedback to staff members about follow-up on identified issues and concerns**
- **Anonymous safety hotlines to encourage staff members and patients to report safety issues**
- **Use of FMEAs and RCAs to prioritize changes and improve care**
- **Simulation training and drills to practice response to potentially high-risk or problem-prone situations (e.g., shoulder dystocia drills on an obstetrical unit or fire drills in the operating room)**
- **Use of multiple communication tools, such as:**
  - SBAR (see section on communication techniques below)
  - Staff assertion
  - Situational awareness – high-risk situations
  - Safety briefings and debriefings
  - Red flag communication regarding critical events
• Use of additional organization resources, such as:
  o Rapid response team
  o Ethics committee

### Risk, Quality and Patient Safety Indicators

The Joint Commission’s standards support the importance of systematic processes to monitor, analyze and enhance performance to improve patient outcomes. “The best way to achieve better care is by first measuring the performance of processes that support care and then by using that data to make improvements.” The Joint Commission’s Performance Improvement Standards address high-risk processes which “should always be measured because they involve risk and can harm patients.” Identifying and addressing potential risk issues require a team effort.

The responsibilities for monitoring and evaluating perioperative patients should be specifically assigned. Departmental initiatives associated with improving performance and quality should be in harmony with the organization’s quality improvement strategies. A performance improvement plan for perioperative services needs to be comprehensive. A comprehensive performance improvement plan includes, for example, the scope of services that the department provides; strategies to identify functions and processes which may require risk mitigation or performance improvement attention; processes that are designed to collect, analyze and evaluate the patient care services provided; and a method to report, document and maintain quality improvement activities.

Measurement indicators (monitors) should reflect the scope of care and treatment for perioperative services. Indicators should be criteria-based to decrease subjectivity and be aligned with evidence-based practices or best practice expectations. Individuals charged with the responsibility for data collection and monitoring activities should receive education about the data collection process to ensure that a systematic and standardized approach for data collection takes place. Data from measurement activities must be accurate. Accurate data collection methodologies and analyses not only help identify opportunities for improvement, but also help determine the effectiveness of actions taken in response to identified opportunities for improvement.

In the perioperative arena, any number of indicators may be developed to address the scope of care and treatment the department provides. Perioperative services, which includes surgery, anesthesia and nursing, often review case cancellations, cases with complications and injuries, room turn-around times, cases in which the OR team was not prepared for the patient (e.g., MRSA positive, latex allergy), and documentation in the medical record. Each of the service areas should have indicators that address the scope of care for the services they provide.

Indicators that address the scope of care for surgical services may include the following:

- Appropriate antibiotic prophylaxis
- Surgical procedures (inpatient and ambulatory) performed laparoscopically/endooscopically resulting in injury to an organ
- Surgical procedures (inpatient and ambulatory) performed laparoscopically/endooscopically resulting in death within 48 hours post-operatively
- Surgical procedures (inpatient and ambulatory) performed laparoscopically/endooscopically resulting in unplanned return to the operating room within 48 hours
- Surgical procedure (inpatient and ambulatory) that requires blood transfusion within 48 hours
- Retained needle, sponge or instrument
- Skin injury intra-operatively or post-operatively (e.g., cautery burns, positioning)
- Post-operative wound infection
- Appropriate venous thromboembolism prophylaxis
- Intra-operative or post-operative pulmonary embolism diagnosed during hospitalization and within 30 days of surgery
- Intra-operative or post-operative deep vein thrombosis diagnosed during hospitalization and within 30 days of surgery
- Intra-operative or post-operative acute myocardial infarction diagnosed during hospitalization and within 30 days of surgery
- Patients diagnosed with post-operative ventilator-associated pneumonia
- Mortality within 30 days of surgery
- Readmission within 30 days of surgery
- Episodes of hypo/hyperthermia
- A time- and outcome-focused review of indicators/outcome measures for new surgical procedures

Indicators that address the scope of care for anesthesia services may include the following:

- Anesthesia awareness
- Operative deaths (including PACU)
- Deaths or cardiopulmonary arrests within 48 hours of conscious sedation or general/regional anesthesia
- Failed tracheal intubation and intubation injury
- Renal insufficiency within 48 hours of anesthetic care
- Non-cardiogenic pulmonary edema within 48 hours of anesthetic care
- CVA within 48 hours of anesthetic care
- Peripheral nerve deficit within 48 hours of anesthetic care
- Myocardial infarction within 48 hours of anesthetic care
- Medication error
- A time- and outcome-focused review of anesthesia provided for new surgical procedures

Indicators that address the scope of care for nursing services may include:

- Infection prevention awareness
- Count accuracy/discrepancy
- Patient assessment after positioning
- Hand-off communication
- Appropriate use of surgical attire
- Pre-operative screening for malignant hyperthermia
- Deep vein thrombosis assessment and intervention activities
- Patient safety practices
- On-call practices
- Medication safety in the OR suite
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- Universal Protocol practices
- Patient identification and verification processes
- Cleanliness of the perioperative environment of care

### Documentation – The Perioperative Medical Record

The medical record is first and foremost a patient care record for continuity of care. The medical record is also a legal document for a healthcare organization. The medical record serves as a repository of all the care, services and treatments that a patient received. As a legal document, the medical record must withstand the test of time, as claims may arise long after a service was provided. The documentation in the medical record should be complete, accurate and comply with all applicable laws and regulations. A medical record may be used as evidence in litigation and may be the key to a successful defense.

Healthcare information management directives may arise from federal (e.g., HIPAA) and/or state laws and/or regulations. Medical record documentation is critical, as undocumented care or treatment may be construed as not having been rendered, as evidenced by the old axiom, “If it isn’t documented, it wasn’t done.” In general, statements made by parties outside of court are considered hearsay and therefore not admissible as evidence. While medical record documentation is technically considered to be hearsay, it may be admitted as evidence under an applicable exception to the hearsay rule. Generally speaking, such an exception requires the record to conform to the following:

- The record has been documented in the normal course of business, following usual routines.
- The record has been kept in the regular course of business.
- The record was made at or near the time of the events/subject matter.
- The record was made by someone within the organization with actual knowledge of the recorded acts, events, conditions, opinions or diagnoses.10

Electronic health records (EHRs) may also be admitted as evidence, provided that the system that produced them is shown to be accurate and trustworthy. Such proof would include the following:

- The type of computer that was used, and that it is generally accepted as standard and efficient equipment
- The methodology for creating, updating and maintaining the record.
- The manner and circumstances under which the record was prepared, including:
  - The sources for its information
  - The procedures for entering and retrieving information
  - The controls, checks and tests in place related to accuracy and reliability
  - Ensuring that information has not been altered11
The Basics of Documentation

Authorship

All authors of entries in the medical record should be duly authorized by the organization’s healthcare information management policies to document in the medical record.

The authentication of entries in the medical record is addressed by the Centers for Medicare & Medicaid Services (CMS) in the Interpretive Guidelines for §482.24(c)(1), to wit:

- The hospital must have a method to establish the identity of the author of each entry. This would include verification of the author of faxed orders/entries or computer entries.
- The hospital must have a method to require that each author takes a specific action to verify that the entry being authenticated is his/her entry or that he/she is responsible for the entry, and that the entry is accurate.12

Signature

The Interpretive Guidelines for §482.24(c)(1) also provide as follows:

Authentication of medical record entries may include written signatures, initials, computer key, or other code. For authentication, in written or electronic form, a method must be established to identify the author. When rubber stamps or electronic authorizations are used for authentication, the hospital must have policies and procedures to ensure that such stamps or authorizations are used only by the individuals whose signature they represent. There shall be no delegation of stamps or authentication codes to another individual. It should be noted that some insurers and other payers may have a policy prohibiting the use of rubber stamps as a means of authenticating the medical records that support a claim for payment. Medicare payment policy, for example, no longer permits such use of rubber stamps. Thus, while the use of a rubber stamp for signature authentication is not prohibited under the CoPs and analysis of the rubber stamp method per se is not an element of the survey process, hospitals may wish to eliminate their usage in order to avoid denial of claims for payment.13

Initials

Initials may be used to authenticate forms such as medication records and flow sheets, but initials should not be used for entries when a signature is required by law (e.g., nurses who sign as witnesses of signatures on an informed consent form). Forms that allow multiple individuals to initial on a single form should have a mechanism to identify all of the signers who are initialing the form. Examples of forms that may contain the initials of multiple individuals include a vital sign flow sheet or intake/output logs. A signature log with the full name, title, signature and initials of each person who initials the form may serve as a mechanism to identify these individuals.
Abbreviations

In 2001, The Joint Commission published *Sentinel Event Alert* that addressed medical abbreviations.\(^{14}\) A year later, a National Patient Safety Goal (NPSG) required “accredited organizations to develop and implement a list of abbreviations not to use.”\(^{15}\) The Joint Commission created its own “do not use” list of abbreviations in 2004, as part of the requirements for meeting the NPSG.\(^{16}\) Then in 2010, the Joint Commission integrated NPSG.02.02.01 into the Information Management Standards, specifically IM.02.02.01, Elements of Performance 2 and 3.\(^{17}\) All healthcare personnel should be aware of the abbreviations deemed approved and non-approved within their organization. Only approved abbreviations should be used in the medical record. EHRs may be formatted to disallow non-approved abbreviations.

**Timeliness of Entries**

Every entry in the medical record should have a date and time. Entries must be made at or near the time of an event or observation. An entry should never be made in advance. If it is necessary to add an addendum, the addendum should be entered in real time (the time/date of the addendum entry) and noted as an addendum or a late entry. Do not attempt to go back and add entries after the initial entry is made in an attempt to make it look like part of the original entry. Attempts to make a late entry look like part of an original entry may give the appearance of tampering or altering a record. Although there is no time limit to add a late entry, the passage of time usually equates with an increasing depth of suspicion as to the reliability of the entry.

**Amending an Entry**

If an error is made during documentation, place a single line through the error and initial the strikethrough; do not use a marker or correction fluid. Care should be taken to not obliterate the original entry. Document the corrected entry with the date, time and signature. There is no need to use red pen. Electronic record corrections generally utilize system protocols for authentication, as well as allowing for the ability to produce “audit trails” to determine when medical records are amended and by whom.

Confidentiality

All patients have a legal right to confidentiality of their individually identifiable healthcare information. Although personal health information contained in computers may be generally considered to be more secure than records kept on paper, staff members must still be careful. For example, they must avoid sharing their computer passwords. In addition, nurses must also sign off from the computer when they complete their documentation. Additionally, all staff members need to be periodically reminded to avoid discussing individually identifiable health information in public areas, such as elevators, cafeterias or even in holding and recovery areas where patients or visitors may be in close proximity.
Nursing Ethics

The Board of Directors of the American Nurses Association (ANA) and the Congress on Nursing Practice initiated the development of a nursing code of ethics in 1995.18 After much work and various reviews, a fully revised Code of Ethics for Nurses With Interpretive Statements was issued in July 2001.19 Ethically, the nurse has a primary commitment to the patient.20 Indeed, the code states, “The nurse promotes, advocates for, and strives to protect the health, safety and rights of the patient.”21 Occasions may arise when a nurse is concerned about a patient and solicits the patient’s provider for advice or assistance. Generally, the nurse is satisfied with the attention paid by the provider and the issue is resolved. There are times, however, when the concern may not be addressed to the nurse’s satisfaction. In these instances, the nurse is ethically bound to continue advocating for the patient and ensure that the issue is resolved. One way to continue to advocate for the patient is to invoke the chain of command.

Chain of Command

Despite the efforts of healthcare personnel to clearly communicate patient needs, there may be occasions when medical providers and nurses disagree about what may be in a patient’s best interests. Nurses are expected to be patient advocates and use their professional judgment. If at any time a nurse feels that a patient’s best interests are in jeopardy, the nurse must bring the situation to a higher authority within the organization. Informing someone with greater authority is commonly referred to as invoking the chain of command. With regard to healthcare, the chain of command has been defined as follows:

Chain of command in healthcare refers to an authoritative structure established to resolve administrative, clinical, or other patient safety issues by allowing healthcare clinicians to present an issue of concern through the lines of authority until a resolution is reached.22

Every organization should have a clearly defined chain of command policy and procedures that are understood by all staff members. It is important to note that progress up the chain of command may vary, based on the situation at hand. At times, the issue may be resolved after a nurse contacts his or her immediate supervisor. At other times, the issue may not be resolved until the hospital’s leaders, medical executives and/or the members of the governing body have been informed about the situation. A process should be established to review enactments of the chain of command by the appropriate quality oversight committee.

Clinically Pertinent Assessment, Intervention, Communication and Documentation

Nursing documentation regarding patient care, observations and treatments should be clinically pertinent. The Perioperative Nursing Data Set (PNDS) offers a standardized approach for documenting patient care. It includes data collection elements, perioperative nursing diagnoses, interventions and outcomes.23 PNDS includes a standardized nursing vocabulary and
documentation guidelines, which may be used to document the experience of perioperative patients.24

Recommended documentation practices published by AORN note that the medical record should reflect the plan of care for perioperative patients, as well as assessments, diagnoses, outcomes, implementation of patient care planning and an evaluation of nursing care.25 Furthermore, policies and procedures guiding the perioperative documentation process should be current and available in the practice setting.26

A nursing plan of care for perioperative patients begins with a comprehensive nursing assessment. Critical thinking skills will help nurses to systematically identify a patient’s needs and plan interventions that are clinically appropriate for the patient. The comprehensive assessment should address a review of the patient’s pertinent health information, which would include, but is not limited to, pertinent medical and surgical histories, medications and the patient’s psychosocial information. Information for the patient assessment may need to be obtained from a family member. AORN also provides guidance regarding the patient assessment process.27

Sales Representative Presence in the Operating Room

Hospitals typically permit the presence of sales representatives in the operating room suite during procedures. However, there is an increased risk of liability against the organization if the sales representative is permitted to directly participate in the surgical procedure.28

In Smart vs. Johnson and Johnson, et.al., a hospital in New York was fined for quality-of-care violations related to the death of a young woman undergoing a hysteroscopic procedure.29 The hospital, despite having policies to address the presence of sales representatives in the OR, allowed the sales representative to directly participate in the procedure, failed to obtain patient consent for the presence of the sales representative in the OR, and failed to ensure that the device being used was approved by the hospital before being used on the patient.30

In order to avoid the liability seen in the Smart case, it is important to develop and strictly adhere to policies and procedures that address the following:

- A process for the written prior approval of the sales representative’s presence during the procedure
- Patient consent for the presence of a sales representative in the surgical suite during the procedure
- Patient confidentiality
- Limiting the role of the sales representative to observation and providing advice only
- An approval process for use of medical devices during surgical procedures
- Quality monitoring for adherence to policy provisions31
References


8. The Joint Commission, Accreditation Requirements – Hospital Program, Performance Improvement – About This Chapter.


11. Ibid.


13. Ibid.


15. Ibid.

16. Ibid.

17. Ibid.


19. Ibid.


27. Ibid, p. 5.


29. Ibid.

30. Ibid.

31. Ibid.
Section 3.2

Patient Safety Practices: Care of the Perioperative Patient

Standards of Practice

Many specialists seek practice guidance from professional associations that are accepted as leaders in a given specialty. The practice of perioperative nursing receives guidance from the Association of periOperative Registered Nurses (AORN). As stated in the its Mission Statement (in part), “AORN’s mission is to promote safety and optimal outcomes for patients undergoing operative or other invasive procedures by providing practice support and professional development opportunities to perioperative nurses.”

The focus of this section is on safety practices for perioperative patients.

Universal Protocol

While there are many factors associated with providing operative and invasive treatments on patients, three critical factors stand above all others for surgical patients. These factors are the right patient, the right procedure and the right surgical site. The Universal Protocol was developed to decrease variation and standardize practice in settings where surgical procedures occur. By following this protocol, the surgical team takes the required steps to proactively avoid a mistake that could have devastating results.

By way of background, in July 2003, The Joint Commission’s Board of Commissioners approved the use of a protocol to prevent wrong-site, wrong-procedure and wrong-person surgeries, all of which are all considered sentinel events. This protocol, which was dubbed the Universal Protocol, became effective on July 1, 2004. The protocol was designed to be implemented in all accredited hospitals, ambulatory care and office-based surgery facilities. The Universal Protocol, in its latest form, is now accessible as part of the National Patient Safety Goal chapter in The Joint Commission’s accreditation manuals.

What is the Universal Protocol? It has been summarized as follows:

The Universal Protocol - the systematic use of surgical site marking, a preoperative checklist, and a time-out immediately before incision - is effective in preventing the rare but devastating “never event” of wrong-site, wrong-patient, or wrong-procedure surgery.

The three principle components of the Universal Protocol are as follows:
1. Conducting a pre-procedure verification process – UP.01.01.01
2. Marking the procedure site – UP.01.02.01
3. Performing a time-out before the procedure – UP.01.03.01

From 2004 through 2013, The Joint Commission has reviewed 1,037 wrong-site, wrong-procedure and wrong-person events.\textsuperscript{5} It must be kept in mind that the reporting of these events to The Joint Commission is voluntary. Entities may choose to keep sentinel events that occur in their organizations to themselves. Accordingly, it is reasonable to assume that the incidence of wrong-site, wrong-procedure and wrong-person surgeries is actually higher than what is reflected the above statistic.

## Care for the Surgical Patient

There are three distinct phases of care for perioperative patients. The three phases are the pre-operative phase, the intra-operative phase and the post-operative phase. During each of these phases, the perioperative nurse remains focused on the needs of the patient and the patient’s family. Ensuring that surgical patients have a safe journey throughout this process requires a commitment from all members of the surgical team.

AORN has developed a Perioperative Patient Focused Model that is divided into four domains: patient safety, physiological responses, behavioral responses and the health system.\textsuperscript{6} This model serves as the conceptual framework for perioperative nursing practices.\textsuperscript{7}

The model also frames the language of the discipline of perioperative nursing. The perioperative nurse administers to the needs of surgical patients by following the nursing process: patient assessment, diagnosis, outcome identification, planning, implementation and evaluation.\textsuperscript{8}

The patient is at the center of the Perioperative Patient Focused Model.\textsuperscript{9} AORN stresses that whatever the setting, wherever it may be located, and whatever the make-up of the patient population, “there is nothing more important to the perioperative RN than the patient.”\textsuperscript{10}

Standards of perioperative clinical practice guide nurses through each of the three phases of care and help perioperative nurses manage the risks associated with each phase. In addition, the perioperative nurse addresses technical as well as patient-related activities during each of the perioperative phases. Standards of practice are a constant reminder that patient safety is an integral part of the activities performed by perioperative nurses during each of these perioperative phases.

- **Pre-Operative Phase**
  The perioperative phase begins when a decision to have a surgical procedure has been made. During this phase, the patient is physically and psychologically prepared for surgery. Transfer of the patient to the surgical bed concludes this phase.

- **Intra-Operative Phase**
  The intra-operative phase encompasses the period of the actual surgical procedure. The perioperative nurse is an integral part of the surgical team during this phase, constantly
ensuring that the patient environment remains safe. Transfer of the patient to the post-
anesthesia care unit (PACU) concludes this phase.

- **Post-Operative Phase**
  
The post-operative phase begins upon the patient’s arrival in PACU. Monitoring the patient
  and evaluating outcomes are key components of care that is provided to patients during
  this phase. This phase concludes when the surgical sequelae have resolved and the
  patient is discharged from the PACU.

Patient safety remains a top priority in each of the three phases. Recommended practices
provided by AORN and regulatory mandates address patient care activities during each of the
perioperative phases. Adherence to recommended practices and regulatory mandates helps
mitigate risks associated with the patient’s perioperative experience. Examples of patient safety
practices within each phase are provided below.

### Pre-Operative Phase: Assessment and Consent

Collaboration between the perioperative nurse and other members of the healthcare team is
clearly visible during the pre-operative phase. During this phase, data collection, analyses and
communications serve as the foundation for anticipated patient outcomes. Communications
include the patient and/or the patient’s guardian/family during all phases of the perioperative
period. Providing patients with information regarding their procedure is vital. This is particularly
important with regard to the informed consent process.

#### Assessment

Pre-operative assessments may occur in numerous settings, including the physician office,
ambulatory surgical sites or an acute care hospital. Regardless of the setting, a systematic
approach to collecting patient data will assist in identifying patient risk factors that the surgical
team must know. Identifying and understanding patient needs, medical diagnoses and
expectations are also part of the assessment process. A comprehensive pre-operative
assessment will help staff members provide the care that surgical patients require.

#### Anesthesia Evaluations

The CMS Interpretive Guidelines provide as follows with regard to pre-anesthesia evaluations:

Interpretive Guidelines §482.52(b)(1)

A pre-anesthesia evaluation must be performed for each patient who receives
general, regional or monitored anesthesia. While current practice dictates that the
patient receiving moderate sedation be monitored and evaluated before, during,
and after the procedure by trained practitioners, a pre-anesthesia evaluation is not
required because moderate sedation is **not** considered to be “anesthesia”, and
thus is not subject to this requirement.
The evaluation must be performed by someone qualified to administer anesthesia as specified in §482.52(a), i.e., only by:

- A qualified anesthesiologist;
- A doctor of medicine or osteopathy (other than an anesthesiologist);
- A dentist, oral surgeon, or podiatrist who is qualified to administer anesthesia under State law;
- A certified registered nurse anesthetist (CRNA), who, unless exempted in accordance with paragraph (c) of this section, is under the supervision of the operating practitioner or of an anesthesiologist who is immediately available if needed; or
- An anesthesiologist’s assistant who is under the supervision of an anesthesiologist who is immediately available if needed.

Although §482.12 (c)(1)(i) provides broad authority to physicians to delegate tasks to other qualified medical personnel, the more stringent requirements of §482.52(b)(1) do not permit delegation of the pre-anesthesia evaluation to practitioners who are not qualified to administer anesthesia.

The pre-anesthesia evaluation must be performed within 48 hours prior to any inpatient or outpatient surgery or procedure requiring anesthesia services. The delivery of the first dose of medication(s) for the purpose of inducing anesthesia, as defined above, marks the end of the 48-hour timeframe.

In accordance with current standards of anesthesia care, some of the individual elements contributing to the pre-anesthesia evaluation may be performed prior to the 48-hour timeframe. However, under no circumstances may these elements be performed more than 30 days prior to surgery or a procedure requiring anesthesia services. Review of these elements must be conducted, and any appropriate updates documented, within the 48-hour timeframe.

The pre-anesthesia evaluation of the patient includes, at a minimum:

- Elements that must be performed with the 48-hour timeframe:
  - Review of the medical history, including anesthesia, drug and allergy history; and
  - Interview, if possible given the patient’s condition, and examination of the patient.

- Elements that must be reviewed and updated as necessary within 48 hours, but which may also have been performed during or within 30 days prior to the 48-hour time period, in preparation for the procedure:
  - Notation of anesthesia risk according to established standards of practice (e.g., ASA classification of risk);
  - Identification of potential anesthesia problems, particularly those that may suggest potential complications or contraindications to the planned procedure (e.g., difficult airway, ongoing infection, limited intravascular access);
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- Additional pre-anesthesia evaluation, if applicable and as required in accordance with standard practice prior to administering anesthesia (e.g., stress tests, additional specialist consultation);
- Development of the plan for the patient’s anesthesia care, including the type of medications for induction, maintenance and post-operative care and discussion with the patient (or patient’s representative) of the risks and benefits of the delivery of anesthesia. ¹¹

Consent

Patient preparation for the surgical procedure includes educating the patient about the surgical procedure so that the patient may provide an informed consent. CMS provides as follows in the Interpretive Guidelines for §482.51(b)(2)[in part]:

The primary purpose of the informed consent process for surgical services is to ensure that the patient, or the patient’s representative, is provided information necessary to enable him/her to evaluate the proposed surgery before agreeing to the surgery. Typically, this information would include potential short- and long-term risks and benefits to the patient of the proposed intervention, including the likelihood of each, based on the available clinical evidence, as informed by the responsible practitioner’s professional judgment. Informed consent must be obtained and the informed consent form must be placed in the patient’s medical record, prior to surgery, except in the case of emergency surgery. ¹²

The use of a separate informed consent for anesthesia has been addressed in the literature:

Proponents of a separate, written anesthesia consent form argue that the common risks can be clearly detailed on a separate form, and patient-specific risks can be written in longhand, thus decreasing the time necessary for documentation. Opponents state that patients seldom read or understand preprinted consent forms and that a separate anesthesia consent form only adds an additional layer of paperwork. Opponents also worry that the form itself might be inappropriately substituted for the informed consent process. ¹³

The use of a separate form for anesthesia consent was discussed in an article published in the ASA Newsletter, which stated that:

The main reason why all four lawyers on the ASA staff firmly believe that anesthesiologists should always personally obtain and document in a separate, distinct form their patients’ informed consent to the anesthesia service is based on managing legal risk. ¹⁴... Although there is no empirical evidence that the IG-style [Interpretive Guidelines] informed consent process and separate anesthesia consent form lead to improved patient care, lawyers believe that they offer better protection to their clients. They also are required by an increasing number of states. ¹⁴
Patients must be provided with consent forms that are written in a manner that they are able to understand (e.g., written at a fifth grade reading level). While healthcare professionals have no difficulty understanding medical terminology, the same information may be confusing to lay people. Accordingly, it is important to clearly explain any medical terminology used on consent forms. Equally important is the need to ensure that the form is signed and dated by the appropriate individuals. An appropriately completed and signed consent form needs to be in place before the operative procedure is initiated.

If a do-not-resuscitate (DNR) directive or order is in place, it is important to thoroughly address it in the overall context of informed consent. The American Society of Anesthesiologists provides the following guidance:

IV. Any clarifications or modifications made to the patient’s directive should be documented in the medical record. In cases where the patient or designated surrogate requests that the anesthesiologist use clinical judgment in determining which resuscitation procedures are appropriate, the anesthesiologist should document the discussion with particular attention to the stated goals and values of the patient.

V. Plans for postoperative care should indicate if or when the original, pre-existent directive to limit the use of resuscitation procedures will be reinstated. This occurs when the patient leaves the post-anesthesia care unit or when the patient has recovered from the acute effects of anesthesia and surgery. Consideration should be given to whether continuing to provide the patient with a time-limited or event-limited postoperative trial of therapy would help the patient or surrogate better evaluate whether continued therapy would be consistent with the patient’s goals.

VI. It is important to discuss and document whether there are to be any exceptions to the injunction(s) against intervention should there occur a specific recognized complication of the surgery or anesthesia.

VII. Concurrence on these issues by the primary physician (if not the surgeon of record), the surgeon and the anesthesiologist is desirable. If possible, these physicians should meet together with the patient (or the patient’s legal representative) when these issues are discussed. This duty of the patient’s physicians is deemed to be of such importance that it should not be delegated. Other members of the health care team who are (or will be) directly involved with the patient’s care during the planned procedure should, if feasible, be included in this process.15

Patient Identification

In keeping with the Universal Protocol, verification of the patient’s identification occurs when the care of a patient is transferred to another member of the care team. The process to ensure that the patient has been correctly identified should be consistent in approach and well-documented in the medical record. A patient’s transfer to the operative suite represents another opportunity for patient verification, as well as verification of the procedure and the surgical site.

Positioning

After the patient, procedure and site have been verified, the patient is positioned for the surgical procedure. The purpose of positioning is to maintain the integrity of the patient’s skin and other body systems.

After positioning, the patient should be reassessed regularly to ensure that all of these body systems are not compromised. AORN notes that these reassessments should include, but not be limited to, respiratory, circulatory, neurologic and musculoskeletal/integumentary systems.16

During the intra-operative phase, the patient is particularly vulnerable. Regular patient reassessments provide objective data that will help the operative team know whether an intervention is required. The monitoring that is conducted during this phase should be well-documented in the intra-operative record, as should any interventions that are performed.

Counts

Besides keeping track of all the equipment and supplies that are used for patients undergoing a surgical procedure, counts help prevent an unexpected and unplanned retention of a foreign object in the patient’s body. Sometimes a foreign object is intentionally retained as part of the surgical plan. Drains and implanted devices are examples of foreign objects that the surgeon intends to leave in place. The unplanned retention of a foreign object should never occur. It is generally the responsibility of the circulating nurse to maintain an intra-operative record. This record includes documentation of all counts.

Counts include sponges, sharps, instruments and other miscellaneous items that may be used during the operative procedure. Keeping track of these items is often the assigned to the circulating nurse. The various counts should be documented in the intra-operative record by the registered nurse circulator.17

Count documentation should include the types and numbers of counts, names and titles of the individuals who performed the counts, the results of the counts, notification to the surgeon of the outcomes of all counts, and instruments or items intentionally left in the patient (e.g., drains, sponges for packing).18
Should a count disparity occur, the documentation should also include what actions are taken and the results of those actions.  

If the count process is omitted or not performed as required by policy, this should also be documented.  

Financial disincentives to eliminate hospital-acquired conditions (HACs) that were not present on admission (POA) have been put in place by CMS. In July 2008, CMS listed 10 categories of HACs and took the position that the care associated with these HACs would no longer be reimbursed (effective October 2008). The very first category on the list was and still remains "Foreign Object Retained after Surgery." Accordingly, the inadvertent retention of foreign objects is not just a quality of care/patient safety issue any longer; it also impacts a hospital’s finances in a very direct and immediate way.

The Joint Commission issued a Sentinel Event Alert in October 2013, addressing the prevention of unintended retained foreign objects in surgery. This Sentinel Event Alert, titled Preventing Unintended Retained Foreign Objects, includes recommendations and potential strategies for improvement.

Post-Operative Phase: Monitoring and Discharge Criteria

The care during the post-operative phase is geared toward supporting the patient’s recovery from anesthesia and the resumption of self-care by the patient or assisted-care by the patient’s family members or other caregivers, as the case may be.

The American Society of PeriAnesthesia Nurses (ASPN) actually divides this post-operative period into three phases – Phase I, Phase II, and Extended Care (Extended Observation/Phase III). These phases are levels of care, not physical places. As ASPN has stated, “the care that is provided is dependent on where the patient is in their physical recovery, not the physical location that they are in.” The nursing roles during these three phases are explained as follows:

**Postanesthesia Phase I** – The nursing roles in this phase focus on providing postanesthesia nursing in the immediate postanesthesia period, transitioning to Phase II, the in-patient setting, or to an intensive care setting for continued care. Basic life-sustaining needs are of the highest priority. **Constant vigilance is required during this phase.**

**Postanesthesia Phase II** – The nursing roles in this phase focus on preparation for care in the home or an extended care environment.

**Extended Care** – The nursing roles in this phase focus on providing care when extended observation/intervention after discharge from Phase I or Phase II is required.
Monitoring and Documentation

Monitoring patients in the PACU begins with a full system assessment within the first few minutes of admission to the unit. A full system assessment includes (but is not limited to) vital signs; respiratory, circulatory and neurological status; level of consciousness; alertness; pain management; and a return of sensory and/or motor control of those areas affected by anesthetics (whether the anesthetic was local or regional). Ongoing assessments and re-evaluations should be completed by the post-anesthesia nurse, along with any interventions the nurse has determined to be necessary. The purpose of all interventions is to achieve desired outcomes, while also affirmatively avoiding undesirable outcomes.

Perhaps needless to say, documentation during the post-operative phases is essential. The documentation should address assessments, reassessments, interventions and the patient’s response to the interventions. Included among the various specific matters to be documented are respiratory status; cardiac status; circulatory status; neurological status; pain, nausea and/or vomiting; the condition of the surgical site; bleeding; temperature; chills or shivering; urinary status; administration of fluids or electrolytes; administration of medications and the patient’s response; administration of antibiotics; the patient’s emotional status; and any unusual events or post-operative complications.

Discharge Criteria

A return to physiological homeostasis alone does not mean that a patient is ready to be discharged from the perioperative area. Instead, full consideration of comprehensive objective discharge criteria is needed to determine whether the patient is ready for discharge. In addition, continuity of care should be addressed via written discharge instructions that have been individualized for the patient. These instructions should include instructions about how the patient should respond to events related to the surgery and/or anesthesia after the patient is discharged.

AORN’s Guidance Statement, Postoperative Patient Care in the Ambulatory Surgery Setting, states as follows:

- Discharge policies should be written and implemented.
- Discharge criteria should be based on standards or general guidelines for discharging patients established by accrediting organizations and anesthesia and postanesthesia provider associations.
- The patient’s postprocedure status should be assessed before he or she is discharged from the postsedation or postanesthesia recovery room.
- Written criteria should include specific guidelines patients must meet before being discharged to the next level of care or discharged directly home. These criteria should include a numeric scoring system to evaluate the patient’s condition.
- Discharge criteria should include an evaluation of the patient for nausea, vomiting, pain, chills, shivering, the surgical site condition, and bleeding. The patient’s
emotional status, fluid and urinary status, cognitive abilities, peripheral circulation, and temperature also should be evaluated.\[35\]

### Safe Practices in the Operating Room

There are multiple inherent risks in the perioperative area including, but not limited to, surgical fires, latex reactions and medication errors. A proactive, multidisciplinary approach to the identification and mitigation of these various risks is critical to achieving a safe surgical environment.

#### Surgical Fire Prevention

The Joint Commission has issued a *Sentinel Event Alert* addressing surgical fire prevention.\[36\] The alert noted that the elements of the fire triangle - heat, fuel and oxygen - are often present together during procedures in the operating room, resulting in an increased risk for patient injury resulting from fires.\[37\] Several interventions to prevent surgical fires are recommended, including, but not limited to, patient preparation suggestions for certain procedures, ensuring that surgical preps are dry before placing drapes on patients and exercising care in the use of lasers and electrocautery units.\[38\]

Surgical fire drills should be conducted on a regular basis, with participation by all members of the perioperative team. Evaluating the performance of the perioperative team and providing feedback will help reinforce desirable practices.

#### Latex Safety

Latex safety is an important issue to address with patients, perioperative team members and other employees. Reactions to latex may range from contact dermatitis to anaphylactic reactions and possibly death.\[39\] The following are important steps in the perioperative management of patients with an allergy to latex:

1. Identify each patient who is at risk. A careful history frequently will elicit episodes of previous allergic reactions or risk factors.
2. Patients who have a suggestive history and confirmatory laboratory findings must be managed with complete latex avoidance.
3. When possible, the patient should be scheduled for elective surgery as the first case of the day. Airborne latex-laden particles are presumed to be at their minimum levels at that time.
4. Signs displaying “Latex Allergy” should be posted on all O.R. doors. No one should enter the O.R. with latex gloves, without scrubbing after taking off latex gloves or while wearing latex-laden clothing from previous latex exposure.
5. Preview all equipment to be used, looking for possible latex-containing products.
6. A latex-free cart should accompany the patient throughout his/her hospital stay.\[40\]
Communication regarding latex allergies is essential. Patients with known or suspected latex allergies should be advised of the hospital’s latex safety plan and assured that proper steps will be taken to avoid exposure. All members of the perioperative team need to be made aware of the patient’s latex allergy.\(^{41}\)

Additionally, ensure that staff members remind one another of the patient’s latex allergy at hand-offs throughout the perioperative period.

**Medication Safety in the Operating Room**

United States Pharmacopeia (USP) conducted a study on medication errors in the perioperative area. The types of medication errors identified in the study included omission errors, unauthorized/wrong drug, improper dose/quantity and wrong time.\(^{42}\) Nearly half of the errors (49.8 percent) occurred during the administering phase.\(^{43}\) Improper doses and improper quantities may be associated with medication administration errors, especially when non-pharmacists prepare medications in the perioperative area. These problems may be avoided by expanding the role of the pharmacy in perioperative care with dedicated staff members participating in the medication process.\(^{44}\)

The Joint Commission’s National Patient Safety Goal NPSG.03.04.01 requires proper labeling of medications on and off the sterile field in perioperative and procedural areas.\(^{45}\) Labels are to include the medication name, strength, amount, diluent and volume (if not apparent from container), expiration date (when not used within 24 hours) and expiration time (when expiration occurs in less than 25 hours).\(^{46}\) All medications that are transferred from the original package into another container must be labeled, even if there is only one medication utilized during the operative procedure.\(^{47}\)

AORN encourages facilities to adopt a safe medication practice policy that is based on the seven “rights of medication administration” (the right patient, the right medication, the right dose, the right time and the right route, right indication, right documentation).\(^{48}\)

Additional recommended standardized processes regarding medication safety in the perioperative area include proper documentation of administered medications, assessing patients for medication contradictions, questioning inappropriate or unclear orders regarding medications, and confirming dosing prior to the administration of weight-based medications.\(^{49}\)

Another sound practice is to bring the organization’s medication reconciliation process to the perioperative area, to ensure that the patient’s medication (including herbal medications and over-the-counter medications) and allergy histories are readily available to the perioperative team. The facility’s standardized medication reconciliation form may be used in the perioperative area.

**References:**

7. Ibid.
8. Ibid, pp. 5-8.
10. Ibid.
12. Ibid.
15. American Society of Anesthesiologists (ASA), Ethical Guidelines for the Anesthesia Care of Patients with Do-Not-Resuscitate Orders or Other Directives That Limit Treatment, Approved by the ASA House of Delegates October 17, 2001 and last affirmed on October 22, 2008.
17. Ibid, pp. 334-345.
18. Ibid.
19. Ibid.
20. Ibid.
22. Ibid.
24. Ibid.

26. Ibid.


37. Ibid.
38. Ibid.
40. Ibid, p. 2.
43. Ibid.
44. Ibid.
45. The Joint Commission, *Accreditation Requirements – Hospital Program*.
46. Ibid, NPSG.03.04.01, Element of Performance 3.
47. Ibid, NPSG.03.04.01, Elements of Performance 1 and 2.
49. Ibid, pp. 289-293.
Section 3.3

High-Risk Clinical Presentations

When patients present for surgery, they often have a myriad of medical problems that may create risks. By taking the patient’s history and using careful screening tools, the physician and other members of the surgical team may gain a better understanding of the potential risks that the surgical patient may encounter. Interventions and monitoring for any presentation of signs and symptoms that may herald the emergence of an unanticipated event is crucial. Planning to avoid risk situations for perioperative patients is essential for a successful outcome. Including the patient, the patient’s family members, the patient’s significant other and/or the patient’s guardian (as appropriate) when making health-related decisions is important. The education of staff members is equally important to mitigate risks, particularly with respect to supporting evidence-based practices that may decrease the risks associated with certain high-risk clinical presentations. Understanding the importance of screening, the use of critical thinking skills, and incorporating prevention strategies will all help reduce risks as patients move through each phase of their surgical experience.

Evidence-based practices for many high-risk clinical presentations are available in the current literature. As more studies are completed and as more information about best practices is discovered, an organization’s exiting policies, procedures and protocols may require modifications. Remaining abreast of the current literature will help ensure that an organization’s documents reflect current practice recommendations.

Regularly scheduled reviews of an organization’s policies, procedures and protocols will help identify disparities between these practices and the recommended practices that may have changed as a result of newly discovered evidence or regulatory imperatives. When developing, reviewing or revising policies, procedures and protocols, the organization should have a defined process in place which clearly directs the use of evidence-based practices for high-risk clinical presentations. High-risk clinical presentations and perioperative policies should be reviewed during staff member orientation and be a basic part of annual competencies. Some examples of high-risk clinical presentations and at-risk patients are discussed below.

Venous Thromboembolism (VTE), Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE)

The disease of venous thromboembolism (VTE) includes both deep vein thrombosis (DVT) and pulmonary embolism (PE). VTE is a relatively common disorder that affects both hospitalized and non-hospitalized patients. It may recur frequently, it is often overlooked, and it can result in long-term complications (e.g., chronic thromboembolic pulmonary hypertension [CTPH], post-thrombotic syndrome [PTS]) or even death.

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Perioperative patients “may present with or encounter one or more of the three primary causative factors of DVT formation.” Additionally, “prevention of DVT reduces the potential for associated complications such as post-thrombotic syndrome and PE.” Accordingly, policies and procedures should be in place which address the assessment of risk factors and the need for mechanical and/or pharmacologic prophylaxis.

According to AORN, the pre-operative patient DVT risk factor assessment should include, but not be limited to the following:

- **Venous stasis:**
  - age greater than 40 years;
  - cancer (e.g., active or occult) and associated therapy;
  - history of cardiac disease;
  - obesity;
  - pregnancy and the postpartum period;
  - prolonged bed rest or immobilization;
  - prolonged travel (i.e., between four to 10 hours within the previous eight weeks);
  - surgery lasting longer than 30 minutes; and
  - varicose veins.

- **Vessel wall injury:**
  - cancer (e.g., active or occult) and associated therapy;
  - central venous catheters;
  - extensive burns;
  - previous history of DVT or stroke;
  - surgery; and
  - trauma (e.g., major trauma, lower-extremity injury).

- **Hypercoagulability:**
  - cancer (e.g., active or occult) and associated therapy;
  - inherited or acquired thrombophilia (i.e., conditions in which the blood coagulates faster than normal);
  - oral contraceptive use or hormone replacement therapy;
  - pregnancy and the postpartum period; and
  - trauma (e.g., major trauma, lower-extremity injury).

- **Other:**
  - acute medical illness,
  - acute infectious processes,
  - inflammatory conditions, and
  - smoking.

“Perioperative nurses’ roles include minimizing risks, initiating preventive measures, and assisting their health care organizations in developing and implementing DVT prevention protocols.” When the surgical patient has been identified as an at-risk patient, efforts must be taken to minimize risks of developing a DVT. The following guidelines have been developed:

- **Minimize Risks**
Perioperative nurses need to assist in efforts to minimize risks associated with prolonged stasis and positioning injuries. Before surgery, the perioperative nurse should complete or review a recently completed assessment of the patient’s risk factors for venous stasis and DVT. The nurse, in collaboration with other members of the health care team, should determine the patient’s risk level using a recognized classification system. Such classification systems are readily available in AORN’s recommended practices\[^a\] or from Web-based resources such as eMedicine.\[^b\]

### Risk Prevention

- After determining the patient’s risk state, perioperative nurses should implement related prophylactic interventions. Order initiation can be facilitated by creating protocols that include clear responsibilities for determining the risk level and implementing interventions.

### Policy Development

- Many organizations have implemented procedures that support a nurse’s ability to implement prevention strategies associated with specific risk factors without requiring a physician’s order. Nurses should collaborate with other members of the healthcare team to ensure that such policies and protocols to prevent DVT are developed and implemented.\[^9\]

The risk for developing a deep venous thrombosis is significant. Nursing education regarding DVT prevention should begin during the perioperative nurse’s orientation period and continue on an annual basis. Competencies and critical thinking skills surrounding risk assessments, prophylactic interventions, reporting and documentation will assist with ensuring that the organization remains proactive in the prevention of DVTs.

### Malignant Hyperthermia (MH)

Malignant hyperthermia has been described as follows:

Malignant hyperthermia (MH) is a potentially fatal, inherited disorder usually associated with the administration of certain general anesthetics and/or the drug succinylcholine. The disorder is due to an acceleration of metabolism in skeletal muscle. The signs of MH include muscle rigidity, rapid heart rate, high body temperature, muscle breakdown and increased acid content. Immediate treatment with the drug dantrolene usually reverses the signs of MH. The underlying defect is abnormally increased levels of cell calcium in the skeletal muscle.\[^10\]

As to the outcome/prognosis:

If a malignant hyperthermia (MH) reaction is treated early in the process, complete recovery can be expected. Multiorgan failure and death can occur, however, and 1 or 2 deaths are reported to the MH hotline each year. Before the approval of dantrolene by the US Food and Drug Administration (FDA) in the late 1970s for use in the treatment of MH, the mortality of an acute MH reaction was greater than 70%. Currently, the mortality of acute MH is less than 5%.\[^11\]
Nursing education relating to MH should begin during the perioperative nurse’s orientation period and continue on an annual basis. Orientation should include, but not be limited to, screening for a family history of MH or other neuromuscular disorders that may be associated with an inherited neuromuscular disorder that places patients at risk of developing MH, development of care plans that includes interventions for patients at risk of developing MH, and recognition of signs and symptoms suggestive of a developing hypermetabolic state. Part of the ongoing education may include informing nurses about the MHAUS Emergency Hotline, which may be accessed in the United States and Canada by calling: 800-644-9737. Competencies and critical thinking skills surrounding risk assessments, interventions, reporting, documentation and follow-up are important elements of an MH educational program.

Implanted Electronic Devices

An implanted electronic device (IED) in a surgical patient can increase the risk of an unanticipated outcome. While a cardiac pacemaker or cardioverter defibrillators may be frequently encountered by some perioperative nurses, other IEDs, such as ventricular assisted devices (VADs) or cochlear implants, may be less frequently encountered. Regardless of what type of IED perioperative nurses may encounter, it is important that the nurses be familiar with these devices and understand that special precautions specific to the IED may need to be employed.

According to AORN, “Perioperative registered nurses should be aware of the potential safety hazards associated with specific internal implanted electronic devices (IEDs) and the appropriate patient care interventions required to protect the patient from injury.”12 IEDs may be affected by other IEDs or other medical equipment in the facility.13 The early identification of an IED during the pre-operative phase will help the surgical team to identify and address the potential risks associated with patients who have an IED.

Education regarding different types of IEDs, including the way the IED functions and any precautions that must be taken with regard to a specific IED should be provided to perioperative nurses during orientation and on an annual basis. For example, patient management for a patient with a neuro-stimulator, osteogenic stimulator or an implantable infusion pump may differ. Providing perioperative nurses with orientation to these and other IEDs will enhance critical thinking skills that will help prevent an unexpected outcome.

References:

2. Ibid.
3. Ibid.


13. Ibid.
Section 3.4

Sample Perioperative Policies and Audit Tool

The following sample policies and procedures and audit tool are available in the Coverys Tool Chest:

- Verification of Informed Consent by Physician and Non-Physician Providers
- Presence of Sales Representatives and New Products/Devices in Operating Rooms/Perioperative Areas
- Perioperative Services Review Guideline Self-Assessment Tool
- Sample Orientation and Competency Assessment: Caring for the Obese/Bariatric Patient