The Effects of Information Technology on Perioperative Nursing

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ABSTRACT

Numerous advances in technology during the past decade require that nurses not only be knowledgeable in nursing science but that they also become educated in information technology (IT). Perioperative IT has the potential to improve the quality of health care, reduce costs, decrease medication administration errors, reduce time spent on paperwork, increase management efficacy, and allow affordable access to health care. Nursing knowledge is needed for designing, implementing, and updating software, including an electronic health record (EHR). With the support of EHR data, nurses will be able to develop best practices for patient care and support research for evidence-based practice. When a standardized terminology, such as the Perioperative Nursing Data Set, is incorporated into an EHR, consistent documentation can be shared among systems. With advances in technology, perioperative nursing roles are expanding in relation to IT requirements and nurses are pursuing additional education. In addition to traditional methods, e-learning is an effective way to provide ongoing technological education.


Key words: informatics nurse specialist, perioperative advanced practice nurse, perioperative robotics nurse specialist, electronic medical record, Perioperative Nursing Data Set, electronic health record.
Human Services Health Information Technology Department, IT will be increasingly used to improve the quality of health care, and using IT should reduce costs, decrease medication administration errors, reduce the time spent on paperwork, increase management efficacy, and allow affordable access to health care.¹

Information technology is important to perioperative nurses because most surgical encounters, now and in the future, will include the use of computers and multiple technical systems. To meet current and future technology challenges, perioperative nurses need to be routinely and appropriately trained in informatics (ie, information science). Informatics supports information systems in the delivery of information via documentation.

This article explores the effects of IT on the perioperative nurse’s practice and the education and training needed to advance perioperative IT use to the next level. An examination of perioperative advance practice nursing roles, the EHR, the Perioperative Nursing Data Set (PNDS), and education requirements for perioperative nurses serves as a means of identifying the changes.

LITERATURE REVIEW
I performed a literature search by using the key words IT, informatics, operating room, perioperative nursing, and surgery to find research articles for this discussion. In the review of the literature, I found very few research studies or general publications on OR nursing and IT, even though the use of IT has had a significant effect on perioperative practice.

Moss and Xiao² investigated whether perioperative IT applications could improve the communication process in the OR and thereby increase patient safety. To decrease the risk of errors and adverse events, the design of any potential IT application must facilitate an understanding of communication patterns among OR staff members. The researchers’ objective was to capture communication patterns that the OR charge nurse used to coordinate OR information needs. The researchers observed the charge nurses’ communication patterns and documentation in four OR suites at three different hospitals. The researchers coded communication patterns in terms of duration, mode, target person, and the purpose of each communication episode; 2,074 communication episodes (69.24%) were observed face to face. Coordination of equipment was the most observed purpose of communication (38.7%) in all four suites, followed by coordination of patient preparedness (25.7%), staffing (18.8%), room assignment (10.7%), and scheduling and rescheduling of surgery (62%). During patient-related communication interactions, the communicator was frequently interrupted or compelled to complete multiple tasks. The researchers concluded that IT or automation of aspects of the surgical patient preparation process and the coordination and management of surgical equipment has the potential to

- increase the speed of information exchange,
- reduce interruptions to clinicians, and
- decrease the possibility of adverse events in the perioperative setting.

Overall, this study identified the communication breakdowns in the OR and provided strong support for the benefits that IT could provide in reducing miscommunication of information.

Bakken et al³ examined EHRs and decision support systems from the perspective of evidence-based practice. The US Department of Health and Human Services has developed a national strategy for a National Health Information Infrastructure (NHII).⁴ The four main goals of NHII are to

- inform clinical practice,
- interconnect clinicians,
- personalize care, and
- improve population health.

According to Bakken et al,³ IT will contribute to the NHII by incorporating these EHR attributes into the workflow in health care practice and documentation. Information technology will help in the development of EHRs, with decision support
attributes that will enhance the quality and safety of patient care.

Nurses are needed to help develop and support this national program. Nursing knowledge is necessary during software development for designing, implementing, and updating clinical data entry and reference tools. With the implementation of an EHR, perioperative nursing practice, research, and education will change. Some of these changes for perioperative nurses will include use of a standardized language, faster access to patient records, and improved interfacing with other departments. Other changes will include availability of research and quality data for audits.

According to an online survey conducted by the Royal College of Physicians and completed by 2,020 nurses, the IT needs of staff nurses are being ignored. Staff nurses believe that they lack necessary training, which limits their judgment on computer technology. The nurse participants indicated they had limited access to computers for learning intentions and that they believed that the IT systems that they were currently using did not address their everyday nursing practice. Many current IT systems are designed on medical models; therefore, they are not effective tools for nurses because they do not address nursing aspects of patient care. The findings suggested that staff nurses want to be involved in the development of their own computer systems. Managers should employ informatics nurses to help staff nurses achieve this goal.

Computer-based learning or e-learning instruction is a convenient and cost-saving method of providing education for staff nurses. Gill studied the effect of e-learning on nursing professionals with regard to their continuing professional and personal development. This study describes how nursing professionals use self-managed learning modules delivered online or via CD-ROM to improve their computer skills. The nursing staff members enlisted in the study completed online questionnaires and were interviewed via telephone after completing each module. Results indicated a 90% improvement in all categories after e-learning.

The nursing staff members agreed that e-learning enhanced their ability to improve patient care. Another study of e-learning also found evidence to confirm that e-learning improves staff nurses’ knowledge and skills. The researchers concluded that instructional software can offer an alternative inservice educational program that allows individual learning to occur.

In 2006, participants in the Technology Informatics Guiding Education Reform (TIGER) Summit concluded that the nursing workforce needed to improve informatics related to patient care delivery. The TIGER initiative is directed toward the nursing profession and its ability to implement informatics principles that would make health care safer and more efficient. The TIGER initiative has identified four basic skills for nurses to learn to successfully integrate health care IT into nursing practice: computer skills, information literacy skills, informatics skills, and attitude and/or awareness skills.

PERIOPERATIVE NURSING ROLES

The range of technologies that perioperative nurses routinely encounter include digitization, tracking mechanisms for staff members and instruments, medication delivery devices, patient monitoring and tracking systems, and advances in biotechnology and nanotechnology. In their daily work, perioperative nurses use robots, digital displays, artificial organs, and magnetic sensors. New IT-enabled communications through mobile...
and wireless devices also have introduced new perioperative procedures. It is imperative that today’s perioperative nurses are highly skilled in all modes of communications technology.12 Wireless devices in the OR include high-definition video monitors for laparoscopic procedures (Figure 1). Anesthesia care providers use personal digital assistants and computers to access medical information. For help or advice, mobile telephones are more efficient than radio pagers and the Voice over Internet Protocol (ie, VoIP) allows voice conversations to be directed over computer networks.13 These wireless devices provide more efficient workflow and allow for improved, consistent documentation with reduced errors. With advances in technology, many perioperative nurses are returning to school to earn advanced degrees, and perioperative nursing roles are expanding in relation to IT requirements.12

**Staff Nurse**

The typical perioperative nurse is expected to be not only a clinician but also a technician, troubleshooter, and educator.14 The perioperative nurse maintains a safe, sterile environment for patients and staff members, acts as the patient’s advocate, and has the necessary skills to circulate and scrub for surgical procedures. One of the responsibilities of the circulating nurse is to manage the electronic equipment for the surgical procedure. The circulating role also includes keeping accurate documentation of the surgery, so computer literacy is important. The circulating nurse continually updates the patient’s record during the surgical procedure (Figure 2). Some of the items that the circulating nurse documents on the patient’s EHR are described in Table 1.

**Perioperative Manager**

The master’s-prepared perioperative manager provides transformational leadership and coaches staff members. An important responsibility of the manager is to ensure and maintain staff members’ skills and competency, and to promote evidence-based research to ensure that staff members have the knowledge to perform their jobs safely and correctly. The manager also should foster the growth, development, and autonomy of all staff members.15 With the advent of EHR use, the manager is responsible for ensuring that each staff member has the necessary IT training to document effectively and efficiently during surgery. The perioperative manager also must be trained in informatics to lead staff members in the electronic revolution.16

**Perioperative Advanced Practice Nurse**

Health care practitioners’ tendency to depend on technology can reduce human contact and thus increase patients’ anxiety, so the role of the master’s-prepared perioperative advanced practice
nurse (APN) has been defined to include specialized knowledge and skills associated with the care of surgical patients and their families. In addition, APNs learn computer skills to assist with their workflow, documentation, and research.

The perioperative APN addresses the needs of the surgical patient before surgery and performs specialty roles during surgical procedures. The EHR informs the perioperative APN of the patient’s arrival. To prevent a delay in surgery, the APN can access the patient’s chart as soon as the patient enters the health care facility to determine whether all necessary tests and procedures have been completed. The perioperative APN performs histories and physical assessments, and perioperative evaluations independently or in conjunction with anesthesia care providers. Early intervention provided by the perioperative APN’s assessment helps identify and prevent possible causes of surgical delays and cancellations, and improves patient satisfaction. The APN assists the surgeon with pertinent information and relays any last minute information to the OR team to create a more positive experience for patients and OR staff members alike.

Advanced education enables the APN to recognize and manage patients’ medical, educational, and emotional needs associated with the surgery. The APN can research the disease process and educate the patient regarding the planned surgical procedure before and after the procedure and collaborate with the surgical team members to provide holistic care for the surgical patient. A perioperative APN can assist the patient during surgery by being empathetic to the patient’s feelings when the patient enters the OR suite. Although perioperative nurses may be familiar with the large display of technology, to a patient, technology can be quite frightening. Touching the patient to provide comfort or acknowledgment of the patient’s presence in the OR can help reduce the cold impression presented by the proliferation of technology.

**Informatics Nurse Specialist**

To be successful, software vendors must create user-friendly products that represent real life in the OR. The master’s-prepared informatics nurse specialist with perioperative experience serves as a subject matter expert in the development of such software. An informatics nurse specialist combines nursing science with computer, information, and cognitive sciences to address the study and management of health care data. Currently, perioperative nurses are engaged in developing standards for the EHR and the types of clinical IT systems needed for their particular care settings, but, with the rapid expansion of IT, a new demand for perioperative informatics nurse specialists has developed. For example, the informatics nurse specialist can become a system administrator in the OR. Certification in this developing field requires additional coursework, experience, and continuing education. A nurse with a master’s degree in informatics and work

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**TABLE 1. Items Documented on the Perioperative Electronic Medical Record**

<table>
<thead>
<tr>
<th>Item Documented</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information (eg, contact information, insurance, advance directives)</td>
</tr>
<tr>
<td>Patient information (eg, assessments, skin condition, hearing deficit, communication barriers)</td>
</tr>
<tr>
<td>Instructions from surgeon’s preference cards (eg, medication doses, routes, dilution)</td>
</tr>
<tr>
<td>Equipment used and serial numbers (eg, electrosurgical unit grounding pad placement)</td>
</tr>
<tr>
<td>Times during the surgical procedures (eg, in room, initial incision, tourniquet use)</td>
</tr>
<tr>
<td>Positioning of the patient and personnel who assisted</td>
</tr>
<tr>
<td>Drains and catheters inserted</td>
</tr>
<tr>
<td>Staff members in the room</td>
</tr>
<tr>
<td>Counting log</td>
</tr>
<tr>
<td>Specimens and implants</td>
</tr>
<tr>
<td>Perioperative Nursing Data Set</td>
</tr>
<tr>
<td>Blood information</td>
</tr>
<tr>
<td>Charges for items used</td>
</tr>
</tbody>
</table>

*Any unusual occurrence requires an incident report to be completed.*
experience in perioperative nursing may find employment opportunities as a software developer, clinical analyst, clinical product specialist, base designer, project manager, hospital system administrator, or health care manager.22

Perioperative Nurse Educator
The perioperative nurse educator is responsible for training new and current staff members. Inservice and e-learning programs must be provided to keep staff members up to date on the latest policies and procedures. Continued education and orientation of new staff members and preceptors are additional responsibilities of the nurse educator. The nurse educator can use the Internet and web-based computer technologies (eg, search tools, communication tools, collaborative writing tools); social networking and bookmarking sites; virtual worlds; and web-based programs, such as Periop 101™, to assist in educating nurses.23

Perioperative Robotics Nurse Specialist
Robotic surgery is increasingly popular at many medical facilities, and staff members must learn new skills to ensure surgical safety. A robotics surgical procedure is similar to a laparoscopic procedure; however, it has the advantage of offering a more three-dimensional view. This virtual reality master-slave robot allows for increased flexibility and dexterity, and the ability to perform microsurgery. The cost for purchasing a robot can be high (ie, approximately $1 million per system), and this price does not include training for perioperative staff members and surgeons.

The increased use and complexity of robotics in the surgical suite has affected perioperative nursing significantly. The perioperative robotics nurse specialist role has emerged and is being recognized nationwide as more hospitals begin implementing robotic surgery. The robotics nurse specialist is responsible for scheduling robotic procedures, ensuring that all equipment is in working order, and assisting during surgery. In addition, the role of the robotics nurse specialist includes assessing the educational needs of the organization, OR staff members, and patients, and acting as the robotics resource person.24

Supply Company Representative
With an IT background, a supply company representative can work with perioperative nurses to develop the concept of surgery-specific supply chain management while reducing costs. An informatics nurse who understands the surgical process has the ability to provide input into the process of obtaining supplies for surgery to facilitate supply-chain management.

Research Consultant
Based on information, the research consultant can use IT to evaluate the latest research related to surgical procedures and perioperative problems. The research consultant can establish best outcomes and evidence-based practices.

Case Coordinator
A case coordinator contributes to cost-effective and efficient clinical patient workups by performing administrative duties, such as scheduling, quality control activities, payroll, and purchasing, and many of these duties are accomplished through documentation in the EHR. The case coordinator provides initial information within the EHR for use by the entire surgical team.

ELECTRONIC HEALTH RECORDS
Today, patients’ health care records are located in many different places, thus, making access to a patient’s complete medical record difficult if not impossible. An EHR holds the patient’s medical record data and has the potential to be transmitted nationwide. Access to electronic health care data could assist not only in delivering information about patients’ quality of health care but also in reducing the number of medical errors and thus lowering costs.25 Compared with paper records, communication and legibility will be improved, thereby decreasing the risk of inconsistent doses and wrong administration of medications. An EHR can help ensure clarity in medication orders.
between the prescribing practitioner and the perioperative nurse administering the medication.26

Software vendors are in the process of developing EHRs to improve the day-to-day operation of the OR. In the past, features and functions were the reasons for choosing software systems. Today, information systems need to support perioperative nursing and OR workflow. Documentation in the EHR needs to occur immediately at the point of care; information needs to be quickly retrievable to ensure that patient care is multidisciplinary, safe, and efficient.27

Data captured within EHRs and the standardized perioperative record should feature clinical and structured data elements.

Electronic health records should display data that is pertinent to the accreditation process and should accurately reflect nurses’ documentation of patient care. Patient data will be used to support better outcomes and best practices for the future of perioperative nursing. If the electronic system does not contain the necessary nursing data elements, then health care decisions will be determined by non-nursing personnel and these decisions will affect how nursing practices are implemented.28 Nurses now have the opportunity to assist in the development of health care software. Practicing nurses can improve patient outcomes by sharing their nursing experience with researchers.29 Software engineers need the expertise of nurses to describe the day-to-day processes of the OR. All that is needed for an OR nurse to assist in software development is

- a strong clinical background,
- a willingness to learn and use software products,
- an ability to translate clinical practice into system applications,
- an ability to apply IT infrastructure to the nursing process,
- team-building skills, and
- strong communication skills.22

In combination with these skills, some perioperative nurses may choose to pursue additional education for a degree in informatics to allow them to serve as nursing practices advocates in the process of developing, implementing, and continually improving EHRs to promote patient safety.30

According to the Joint Commission, organizations must be aware of adverse events that can be associated with implementation of health care IT.31 Use of the EHR decreases safety risks by preventing omission of information as a result of human error; however, safety and effectiveness can be compromised if the EHR is not properly designed, implemented, or installed. It is imperative that staff members receive proper training to ensure safe and effective use of the system. When an EHR is initially integrated into the OR workflow, the new processes around data capture can create work delays and impede surgical case flow. The learning process for staff members takes time and initially can reduce the speed of the workflow, thereby potentially frustrating surgeons and increasing safety risks for patients. Routine use of EHRs facilitates efficiencies in workflow, and properly executed training can minimize delays during the learning curve.

The federal government is coordinating efforts to allocate resources to provide safe care for all patients, including patients undergoing surgical or other invasive procedures, through adoption and use of the EHR.32 The 2009 economic stimulus package includes a requirement to develop and implement a universal EHR.33 Use of a national EHR will promote sharing of health care data, which will facilitate the use of best practices and
standards among health care providers. According to the National Health Information Network, a nationwide EHR system will allow access to patient care information for clinical decision making and will be a reflection of reimbursement for medical bills by insurance companies. The National Health Information Network web site illustrates how the accumulation of national data could provide evidence that influences practice.

Concerns regarding privacy would be addressed by a national health record bank with independent privacy and security audits, similar to classified military information. For this to exist, all providers would have to implement EHRs. It is not universally accepted, however, that a government-managed national health record bank is ideal for protecting privacy or beneficial to medical decisions of private citizens.

THE PERIOPERATIVE NURSING DATA SET

If an EHR is to be successful nationwide, then a universal nursing language and protocols must exist. In 1980, AORN recognized the need for a national, homogenized, perioperative nursing language and began development of a standardized language for documentation in the OR known as the PNDS. The overall goal of the PNDS was to provide a way for perioperative nurses to communicate nationwide by using a structured vocabulary. The language needed to be concise and consistent with the description of the perioperative setting. The PNDS focuses on the perioperative patient’s experience from preadmission to discharge. The PNDS gives perioperative nurses

- a framework to standardize documentation,
- a universal language for perioperative nursing practice and education,
- a method to measure and evaluate patient care outcomes,
- a foundation on which to base perioperative nursing research and evaluation of patient outcomes, and
- data about the contributions of nurses to patient outcomes in the perioperative arena.

In 1999, the American Nurses Association officially recognized the PNDS as the perioperative nursing terminology.

The PNDS is an evidence-based and clinically validated nursing language that can be used in clinical practice, education, and research. This data set was mapped to the Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) in 2003, which refers to terminology that supports the electronic exchange of data. A study to validate mapping concepts between the PNDS and SNOMED CT was completed to guarantee that concepts represented in one system have equal meaning in another. The goal was to validate semantic comparability between the two terminology systems, to evaluate placement of the PNDS concepts in the SNOMED CT hierarchy, and to identify whether the assignment of PNDS concepts in the SNOMED CT hierarchy is the same for all mapped PNDS concepts. The results showed that all PNDS concepts were semantically comparable with the mapped SNOMED CT concepts. To have a fluid workflow across the perioperative continuum for perioperative nurses nationwide, these concepts must match; otherwise, the EHR vendors will not be able to configure a mutual language for the EHR system that is effective. Informatics research in data collection and integration of these terminologies in EHRs are two areas that need further study. The researchers suggested that more research is needed to demonstrate the capacity of PNDS terminology and to explain outcomes of care across different settings.

When a standardized terminology is integrated into EHRs, consistent documentation of patient care can be shared among systems. This allows patient histories to be examined and population trends to be monitored. With the support of EHR data, nurses will be able to develop best practices for patient care and support research for evidence-based practice in the future. The PNDS provides nurse-sensitive measures that may be used as a baseline to develop organizational outcomes measures.
Data in the EHR that is based on the PNDS can be used to measure and correlate clinical, financial, and operational outcomes. Some of the outcome data captured includes:

- Information to develop databases for evaluating resource utilization;
- Information to monitor and evaluate quality and effectiveness of care;
- Clinical data from large numbers of patients and facilities;
- Information to benchmark across settings and institutions;
- Information necessary to examine the relationship of cost to quality and effectiveness;
- Clinical data for decision making and policy formulation;
- Information necessary to calculate, manage, and reimburse the costs of clinical and administrative functions in the perioperative areas; and
- Information to support health care policy and federal and state regulatory development.39

AORN recognizes the significance of and supports the federal mandate to create an EHR by 2014 and is facilitating the process through the development of the AORN SYNTEGRITY™ Standardized Perioperative Framework. This system will facilitate standardization of perioperative documentation by using the PNDS, which is crosswalked to clinical standards, accreditation specifications, regulatory requirements, and mandatory reporting criteria. This data map (ie, schema) incorporates the perioperative workflow process for all phases of perioperative patient care. In addition, it uses a standardized nursing language for all data elements.

AORN licenses the AORN SYNTEGRITY™ Framework to information system vendors nationwide for incorporation into their software clinical information systems.36 For a vendor’s information system to provide standardization, a common language must be established that is consistent with perioperative nursing practices worldwide. The SYNTEGRITY Framework includes the PNDS, standardized language mapped to standardized fields and values, standardized workflows, recommended practices, standards, and regulatory requirements. The SYNTEGRITY Framework also includes an electronic companion guide for quick searches, charting, and references. The SYNTEGRITY Framework is available to vendors for implementation into their EHR systems.40 Facilities that decide to use the SYNTEGRITY Framework will be able to participate in AORN’s national perioperative data repository, which has yet to be developed but will assist with benchmarking throughout the nation. The standardized de-identified data included in the repository will be protected through development requirements. This secured data will allow professionals to measure outcomes and evaluate patient care and effectiveness, thus contributing to evidence-based practice.36

EDUCATION OF PERIOPERATIVE NURSES

In the advanced IT environment, the perioperative nurse is always learning about new equipment and procedures.14 Electronic surgical equipment is constantly changing. This necessitates a continual update of nursing knowledge and skills, and requires quick mastery of new technology.41 In larger institutions, perioperative nurses may not be able to function in a variety of surgical specialties because of this technological explosion,12 thus, perioperative nurses are more often becoming specialized in one specific service within the OR (eg, orthopedics, robotics).
Advanced technology has changed skill requirements for perioperative nurses as well as for surgical practice. For example, it has been estimated that one surgical procedure can use 50 pieces of IT equipment at a time. Perioperative nurses must continually update IT skills, and many feel the need to take technical courses to remain current. It is doubtful that basic nursing education programs can keep up with these IT changes; therefore, it is recommended that health care organizations develop on-the-job training programs to keep their nurses current. Sales representatives often educate nurses because the complex equipment requires hands-on training. Some technologies require specialization or certification. Perioperative nurses across the spectrum of practice experience will require education as new IT is developed and introduced to the perioperative environment.

Orientation
Hospitals across the nation struggle with the problem of recruitment and retention of staff nurses. The competition for both experienced and inexperienced staff nurses has contributed to high turnover among perioperative nurses. The OR environment is uniquely stressful; surgeons and staff members often are on edge and tired. With the continued shortage of nurses, the job can be very challenging. Most ORs generate 42% of the hospital’s income; therefore, it is important to keep this department fully staffed.

When new nurses start their training in the OR, it can be very intense, and typically nine months of training are required before a nurse becomes somewhat proficient in a variety of surgical procedures. An additional consequence of the nursing shortage is that, as the need for staff members increases, the training time of these new orientees is reduced. The orientee first starts out with the traditional classroom training and is introduced to the OR environment in a mock OR with the educator. Instrument identification and technical training on many electronic devices are crucial aspects of OR nurse training. After classroom training, the orientee is guided by the preceptor to circulate and scrub in for the different services performed at that surgical facility. A positive effect of technological advances is that training can now be offered via the Internet, which can reduce the time and cost of training as well as provide self-paced learning for orientees. Preparing preceptors is a critical factor in retention of orientees. The preceptor’s role is complex and requires continual updates on responsibilities for mentoring orientees.

E-learning
Before a new nurse begins working in the perioperative department, the master’s-prepared educator assesses the orientee’s knowledge and preferred learning method because orientation timelines affect the organization’s budget. This can be accomplished by introducing supplemental training before classroom instruction. Online software programs used to recruit, educate, and retain perioperative nurses should support PNDS outcomes and be established on evidence-based practice. AORN offers such a program, Periop 101: A Core Curriculum, to educate the new perioperative nurse in all aspects of the OR and reduce the costs associated with training. In addition, the program offers e-learning for preceptors and educators. This online software contains 25 learning modules that will help new perioperative nurses become competent and provide the new orientee with 40 nursing contact hours upon completion.

The Periop 101 learning modules are listed in Table 2. The program was written and reviewed by subject matter experts, AORN’s nursing staff, and AORN members. Costs include an AORN Online Learning Center per site fee and a cost per student based on the total number of students using the online evidence-based education program. AORN develops perioperative standards and recommended practices, and Periop 101 is updated frequently to reflect changes in standards.
and best practices. The online delivery mechanism allows for changes and updates to occur quickly and efficiently. This software is user friendly, and both the administrator and student have the support of the AORN Nursing Department. Each student who successfully completes Periop 101 can obtain a one-year free membership in AORN. The Periop 101 online directory allows students to find Periop 101 programs throughout the country. Periop 101 is available through AORN and is also distributed by HealthStream and MC Strategies.

Some nurses have acquired the skill of using the electronic documentation, whereas others are struggling with this change. The majority of nurses today are older than age 40 years and are only accustomed to paper documentation. The most difficult adaptation for nurses in this demographic is not the physical change but the psychological changes that come from using the computer. Perioperative nurses fear that they will not be successful, will feel inadequate, or lack confidence in their own performance. These fears can interfere with the ability to learn and adapt to the new technology. To combat this fear, computer-based learning has been implemented monthly in some institutions to assist perioperative nurses in obtaining these crucial technical IT skills.

Today, newly educated nurses are being introduced to IT in the college classroom. Informatics, software management, radiology, and physics are incorporated into everyday coursework. Some believe that the future for OR nursing education is destined to be simulation rather than clinical experience.

Diverse backgrounds of staff nurses in the health care setting today must be considered. An evaluation of 300 health care professionals with diverse backgrounds revealed that their knowledge increased with online learning. Online learning provided a convenient learning format for nurses from diverse populations and allowed them to expediently update their knowledge.

### Continuing Education

The national goal for implementing EHRs is the year 2014, and, for nursing to be in compliance, many will have to obtain their continuing education (CE) contact hours online as well as attend conferences and workshops. Continuing education for nurses provides professional growth and is recommended by the American Nurses Association for all practicing nurses. Some states require CE for relicensure. For instance, nurses in Illinois must obtain 20 hours of CE every two years to renew their professional nursing license. Thirty states mandate documentation of continued education competencies from all nurses. Perioperative nursing managers and educators must assess and evaluate staff members’ knowledge level and ensure that they have met CE requirements. Successful hospitals of the future will be those

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**TABLE 2. Modules Included in the Periop 101: A Core Curriculum™**

- Anesthesia
- Aseptic technique
- Critical thinking
- Documentation
- Electrosurgery
- Endoscopic surgery
- Environmental sanitation and terminal cleaning
- Homeostasis, sponges, and drains
- Introduction to perioperative nursing
- Latex allergy
- Medications and solutions
- Patient and family education
- Perianesthesia nursing
- Perioperative assessment
- Positioning the patient
- Professionalism
- Safety in the surgical suite
- Scrubbing, gowning, and gloving
- Skin prep
- Specimens
- Sterilization and disinfection
- Surgical draping
- Surgical instruments
- The surgical environment

Periop 101: A Core Curriculum is a trademark of AORN, Inc, Denver, CO.
that approach training and education as an ongoing investment that leads to better skilled, more satisfied employees who are qualified to deliver better patient care.

SUMMARY

Today, IT and informatics are permanently and highly integrated into the delivery of quality health care. With the upsurge in the use of IT in the OR, perioperative nurses must become accustomed to technological changes and be willing to adapt to them readily. As technology changes the OR environment, perioperative nurses are faced with new challenges and opportunities. With budget challenges, time constraints, and the shortage of qualified health care workers in today’s competitive health care market, it is easy to lose sight of the whole picture. The best possible outcome for patients and institutions requires that perioperative nurses participate in the development of procedures and practices that involve the use of technology in addition to acquiring the necessary skills to stay clinically current. E-learning and traditional CE can provide ongoing training. Perioperative nurses also have the opportunity to expand their education and provide much needed specialized skills as APNs and informatics specialists.

Perioperative nurses with advanced educational preparation can undertake different roles in the health care field, such as manager, APN, educator, informatics specialist, or perioperative robotics nurse specialist. No matter what role a perioperative nurse performs, a primary responsibility is to be the patient’s advocate. To do this successfully in the ever-changing, technical, health care environment, perioperative nurses must seek opportunities to advance their IT knowledge and skills. AORN

Editor’s note: SYNEGRITY Standardized Perioperative Framework and Periop 101: A Core Curriculum are trademarks of AORN, Inc, Denver, CO.

References


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The Effects of Information Technology on Perioperative Nursing

PURPOSE/GOAL

To educate perioperative nurses about ways that perioperative nursing and the perioperative work setting are affected by advances in health care information technology (IT).

OBJECTIVES

1. Describe the benefits in implementing health care IT.
2. Identify problems associated with implementing health care IT.
3. Discuss skills nurses need to successfully incorporate IT into nursing practice.
4. Identify perioperative practice roles related to IT.
5. Discuss the Perioperative Nursing Data Set (PNDS) as part of the electronic health record (EHR).

The Examination and Learner Evaluation are printed here for your convenience. To receive continuing education credit, you must complete the Examination and Learner Evaluation online at http://www.aorn.org/CE.

QUESTIONS

1. According to the US Department of Health and Human Services Health Information Technology Department, IT will be increasingly used to improve the quality of health care and
   1. reduce costs.
   2. decrease medication administration errors.
   3. reduce time spent on paperwork.
   4. increase management efficacy.
   5. allow affordable access to health care.
   a. 2 and 3  b. 1, 4, and 5
c. 1, 2, 3, and 4  d. 1, 2, 3, 4, and 5

2. Findings of a Royal College of Physicians’ Survey indicated that many IT systems
   1. address everyday nursing practice.
   2. are designed on medical models.
   3. do not address nursing aspects of patient care.
   4. are not effective tools for nurses.
   a. 1 and 2  b. 2 and 3
c. 3 and 4  d. 2, 3, and 4

3. Skills identified by the Technology Informatics Guiding Education Reform initiative that are needed to successfully integrate health care IT into nursing practice include
   1. attitude and awareness skills.
   2. computer skills.
   3. informatics.
   4. information literacy.
   5. software code writing.
   a. 1 and 5  b. 2, 3 and 4
c. 1, 2, 3, and 4  d. 1, 2, 3, 4, and 5
4. ______________________ combines nursing science with computer, information, and cognitive sciences to address the study and management of health care data.
   a. A perioperative nurse educator
   b. An informatics nurse specialist
   c. A perioperative clinical nurse specialist
   d. A robotics nurse specialist

5. According to the Joint Commission, adverse events that may be associated with implementation of health care IT include
   1. compromised safety and effectiveness if the EHR is not properly designed, implemented, or installed.
   2. creation of new work processes, which could initially impede surgical case flow.
   3. impaired safety and effectiveness of care if staff members do not receive proper training.
   4. reduced speed of perioperative workflow during the IT learning process.
      a. 1 and 2
      b. 3 and 4
      c. 2, 3, and 4
      d. 1, 2, 3, and 4

6. Use of a national EHR will promote sharing of health care data, which will facilitate the use of best practices and standards among health care providers.
   a. true
   b. false

7. The PNDS gives perioperative nurses
   1. a foundation on which to base perioperative nursing research and evaluation of patient outcomes.

2. a universal language for perioperative nursing practice and education.
3. a framework to standardize documentation.
4. a legal resource for malpractice cases.
5. data about the contributions of nurses to patient outcomes in the perioperative arena.
   a. 1 and 4
   b. 2, 4, and 5
   c. 1, 2, 3, and 5
   d. 1, 2, 3, 4, and 5

8. Data in the EHR that is based on the PNDS can be used to measure and correlate clinical, financial, and operational outcomes.
   a. true
   b. false

9. AORN’s SYNTEGRITY Standardized Perioperative Framework facilitates standardization of perioperative documentation by using the PNDS, which is crosswalked to
   1. accreditation specifications.
   2. clinical standards.
   3. mandatory reporting criteria.
   4. regulatory requirements.
      a. 1 and 4
      b. 2 and 3
      c. 1, 2, and 4
      d. 1, 2, 3, and 4

10. Many perioperative nurses resist the change to electronic documentation because
    1. they are only accustomed to paper documentation.
    2. they fear that they will not be successful.
    3. they will feel inadequate or lack confidence in their own performance.
    4. their fears can interfere with their ability to learn and adapt to the new technology.
        a. 1 and 2
        b. 3 and 4
        c. 2, 3, and 4
        d. 1, 2, 3, and 4
OBJECTIVES
To what extent were the following objectives of this continuing education program achieved?

1. Describe the benefits in implementing health care information technology (IT).
   Low 1. 2. 3. 4. 5. High

2. Identify problems associated with implementing health care IT.
   Low 1. 2. 3. 4. 5. High

3. Discuss skills nurses need to successfully incorporate IT into nursing practice.
   Low 1. 2. 3. 4. 5. High

4. Identify perioperative practice roles related to IT.
   Low 1. 2. 3. 4. 5. High

5. Discuss the Perioperative Nursing Data Set as part of the electronic health record.
   Low 1. 2. 3. 4. 5. High

CONTENT

6. To what extent did this article increase your knowledge of the subject matter?
   Low 1. 2. 3. 4. 5. High

7. To what extent were your individual objectives met? 
   Low 1. 2. 3. 4. 5. High

8. Will you be able to use the information from this article in your work setting? 
   1. Yes 2. No

9. Will you change your practice as a result of reading this article? (If yes, answer question #9A. If no, answer question #9B.)

9A. How will you change your practice? (Select all that apply)
   1. I will provide education to my team regarding why change is needed.
   2. I will work with management to change/implement a policy and procedure.
   3. I will plan an informational meeting with physicians to seek their input and acceptance of the need for change.
   4. I will implement change and evaluate the effect of the change at regular intervals until the change is incorporated as best practice.

5. Other: ____________________________

9B. If you will not change your practice as a result of reading this article, why? (Select all that apply)
   1. The content of the article is not relevant to my practice.
   2. I do not have enough time to teach others about the purpose of the needed change.
   3. I do not have management support to make a change.

4. Other: ____________________________

10. Our accrediting body requires that we verify the time you needed to complete the 2.8 continuing education contact hour (168-minute) program: ___________