Mobile Information Technology
Position Statement

Introduction

Communication of patient-related information and collaboration between healthcare providers improves the delivery of safe, high-quality patient care.[1-3] Mobile information technology continues to evolve and become integrated into clinical practice, facilitating communication and accessibility to patient-related information.

The American Association of Nurse Anesthetists (AANA) *Standards for Nurse Anesthesia Practice* emphasize that continuous clinical observation and vigilance are the foundation of safe anesthesia care.[4] Vigilance can be defined as "a state of readiness to detect and respond to small changes occurring at random intervals in the environment."[5] Certified Registered Nurse Anesthetists (CRNAs) have an ethical responsibility to provide safe patient care by avoiding non-essential distractions while caring for a patient.[6] Non-essential distractions, especially those associated with use of mobile information technology (e.g., smartphones, tablets, personal digital assistants [PDAs]), the Internet, and the data accessed through these tools, may lead to significant patient safety lapses.

Purpose

The purpose of this position statement is to present the AANA position on the integration of mobile information technology into the delivery of patient care, to describe the advantages and disadvantages of using mobile information technology in clinical practice, to address patient privacy concerns, to highlight the facility's role in implementation of mobile information technology, and to promote patient safety when integrating mobile technology.

- The AANA supports the thoughtful integration of mobile information technology into clinical practice to improve patient-related communication among members of the patient care team. Mobile information technology must be integrated in a way that enhances patient care while minimizing interruptions and distractions to clinicians.
- The AANA encourages CRNAs to maintain vigilance, patient safety, patient privacy, and infection control while using mobile information technology.
- The AANA encourages CRNAs to participate in the development of institutional policies regarding the appropriate and inappropriate use of mobile information technology for the delivery of patient care, clinician communication, and clinician interaction using social media.

Advantages of Mobile Information Technology

Mobile information technology is equipped with processing power, embedded sensors, and storage capacity.[7] Mobile information devices are portable and compact, and can carry out functions of personal computers, allowing Internet connectivity, video and audio recording, photography, upload and download of files, and accessibility to readily disseminate information.[2] The integration of mobile information technology into clinical practice can have meaningful advantages for clinicians and their patients.

Numerous studies have investigated the impact of mobile and hands-free information technology on communication and team effectiveness. Advantages of mobile information technology include:

- Enhanced productivity, mobility, and work efficiency[8-10]
- Improved information access to electronic health records, medical references, and medical applications (apps)[11-18]
- Improved communication[8-10,14,18,19]
- Reduced medical errors[20]
- Improved mentorship[8,14,15]
- Lower failure-to-respond rate compared to pager users[8-10,19,21-23]
- Enhanced monitoring[11]
- Operability with medical equipment which increases visualization (e.g., fiber optic camera)[17]
- Enhanced communication with patients[17,18]
- Distracting and calming patients, particularly pediatric patients, prior to a procedure[17]

Distractions and Interruptions

Distractions and interruptions are not new in healthcare or the operating room (OR). CRNAs may experience 68 interruptions and distractions per hour, most of which come from operating room personnel, conversation, and noise.[24] There are numerous sources of noise and distraction in the OR environment, including use and movement of equipment, suction apparatus, anesthetic monitors, alarms, increasingly complex equipment, electronic health records, conversations, and music.[3,25] An effect of distractions and noise is the interference with verbal communication, impairment of short term memory, attention diversion, and impairment of cognitive performance.[3,5]

Despite the clinical advantages of mobile information technology, Richardson et al. concluded that many anesthesia professionals find mobile information technology useful for non-urgent matters, but alerts, texts, and calls may lead to unwanted distractions and interruptions.[21] Moreover, clinicians hesitate to integrate mobile information technology into their practice if technological issues, such as network connectivity or unclear transmission, cause increased distractions and decrease the focus on patient care.[10,26,27]

Mobile information technology also makes it easier for clinicians to be interrupted for non-clinical purposes,[18] which decreases a provider's attentiveness to the patient. The field of information technology, smartphones, and social media is rapidly evolving. Little data exists about the prevalence of smartphone use by clinicians for nonclinical purposes in the OR/procedural setting or its impact on clinical vigilance and patient care. In a survey of 439 perfusionists working on cardio-pulmonary bypass cases, more than 55 percent of the respondents reported using their cell phone during the procedure in some form (e.g., phone calls, sending/checking email, internet surfing, social networking, texting).[28] Additionally, 34.5 percent acknowledged that they witnessed a fellow perfusionist distracted with phone use during the procedure.

The use of mobile technology and wireless connectivity provides opportunity for distraction by giving users instant Internet access and linking users to email, e-magazines, e-books, television shows, social media, blogs, games, and thousands of nonclinical mobile apps. Any inattentive behavior during a procedure, such as reading, texting, gaming, using certain device accessories

(e.g., head phones), or using a mobile device to access nonclinical content, should be considered a potential patient safety issue.

Patient Privacy and Confidentiality

Facilities and healthcare providers need to safeguard the security and safety of patient data.[29] With the advent of cameras and video capabilities on mobile devices, healthcare providers must be increasingly cognizant and respectful of patient privacy and confidentiality. Any content posted on social media can rapidly spread beyond the intended audience.

As various social media outlets gain popularity, concerns continue to grow regarding professional boundaries and patient privacy rights protected by applicable law, including the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA).[30-32] HIPAA regulations protect patient privacy by defining individually protected health information (PHI) and establishing how this information may be used, by whom, and under what circumstances.[33,34] The definition of PHI includes any information that relates to the past, present or future physical or mental health of an individual, or provides enough information that could lead someone to identify an individual (e.g., demographic data, name, address, birth date, Social Security Number, etc.).[33,34] PHI should only be stored on facility-approved, encrypted devices or secure servers and only transmitted through facility-approved devices or digital environments with network encryption, secure connections, or HIPAA-compliant messaging services.[35]

All healthcare providers must comply with applicable state and federal privacy laws and organizational policies, including HIPAA. Clinicians must understand that posting PHI or photographs/videos on social media sites, photo-based sites, microblogs, blogs, discussion boards, or wikis, or transmission through email, text, or message to inappropriate individuals can violate applicable law and policies in place to protect patient privacy and confidentiality.

Healthcare personnel should be aware that breaches in confidentiality may result in civil liability to patients,[36,37] job loss,[38,39] disciplinary action by state licensing boards,[34,38,40,41] and even criminal investigations and sanctions.[42] A 2010 survey of Boards of Nursing (BON) conducted by the National Council of State Boards of Nursing (NCSBN) indicated that an overwhelming majority of responding BONs (33 of the 46 respondents) reported receiving complaints of nurses who have violated patient privacy by posting photos or information about patients on social networking sites. The majority (26 of the 33) of BONs reported taking disciplinary action based on these complaints.[33,38,43]

Additional guidance on social media use can be found in the NCSBN *White Paper: A Nurse's Guide to the Use of Social Media*[33] and the American Nurses Association Social Networking Principles Toolkit.[44]

The Facility's Role in Patient Privacy Protection

Mobile information technology users need to apply this technology responsibly and facilities need to develop and implement policies that minimize risk.[18] Clearly defined policies which are tailored to the facility or practice address issues such as data security, appropriate and inappropriate personnel and clinician use of mobile devices for care delivery, clinician interaction using social media, and patient and family use of mobile technology within the facility.

Facility policies enforce the patient protections as outlined under applicable law, including HIPAA, while maintaining an employee's individual right to discuss the terms and conditions of their workplace.[30,32,38] Policy violation ramifications are clearly addressed within the policy. Facilities provide education regarding social media and mobile information technology use and document staff awareness of the policy.[18,38]

Social Media Presence
Clinicians and facilities may use social media and technology for promotional and business purposes.[45] An online presence can benefit patients and the community through education, guidance regarding evidence-based practice, and public health advocacy.[35] Policies outline a social media and technology strategy that includes these components for facility promotional, educational, and advocacy initiatives.[46]

Patient and Family Mobile Information Technology Use
Patients may want to record procedures and share these videos or recordings.[2] The facility evaluates whether it will permit this practice on the premises and creates policies for patients' use of mobile information technology within the facility setting. Strategies may include establishing an official policy that prohibits the use of recording devices in areas of the facility, posting information throughout the facility reminding patients and their families of the mobile information technology use privacy policy, and empowering staff to remain vigilant for recording of procedures or conversations.[2]

Mobile Apps
Mobile apps are application software designed to run on a mobile device. Specific to anesthesia, commonly accessed apps include medical calculators, logbooks, clinical algorithms, tutorials, drug dosage and interaction resources, and references on disease states and conditions.[11,13,47] A current challenge facing apps and emerging technology in healthcare is the lack of assurance of clinical content and validity.[15,16,48] It is important for mobile medical apps used in healthcare settings to be accurate and reliable, especially because clinicians and patients may make critical decisions based on information from an app.[49] The U.S. Food and Drug Administration (FDA) has issued guidance detailing how medical mobile apps are classified and regulated.[50] The FDA defines mobile medical apps as software applications which are to be used as an accessory to a regulated medical device or to transform a mobile platform into a regulated medical device.[50] The AANA urges CRNAs using mobile apps to utilize sound clinical judgment when applying the information provided.

Bacterial Contamination
Bacterial contamination on mobile and other electronic devices is a major concern in all healthcare settings. In the United States, health care-associated infections (HAIs) affect approximately 1.7 million patients each year and lead to 4.5 infections per 100 hospital admissions.[51] Numerous studies have found that over 90 percent of health care workers' cell phones tested positive for bacteria, including methicillin-resist *Staphylococcus aureus* (MRSA) and other organisms that cause HAIs.[52-54] When investigating the risks of bacterial contamination, Jeske et al. found that even after 40 anesthesia professionals used hand sanitizer, most personal mobile devices had critical pathogens on them, indicating that these devices can easily transmit pathogens from hand to device and vice versa.[55]

Bacterial contamination may pose a problem when using mobile information technology in patient care areas. Mobile and other electronic devices should be cleaned with an approved antimicrobial wipe.[53,56,57] UV light has been tested as an alternative to antimicrobial wipes, but more research needs to be done regarding the practicality, reliability, safety and cost effectiveness of its use in practice.[58] Mobile device users should be careful not to use products that may degrade the display screen.[18] Healthcare workers should carry the minimum number of electronic devices with them, adhere to good hand hygiene, and clean their devices appropriately in order to minimize the potential for cross-contamination in the workplace.[59] Cleaning and disinfection protocols for mobile and other electronic devices should be clearly outlined in facility policy. For additional guidance on infection control procedures, review the AANA *Infection Prevention and Control Guidelines for Anesthesia Care.*[60]

Medical Equipment Interference

Mobile devices' potential for electromagnetic interference (EMI) with medical equipment is an important patient safety issue.[18,61] New generation mobile wireless technology, which integrates Internet access to send and receive data, may be of additional concern for inducing higher rates of EMI.[62] Anesthesia professionals have reported observing interference with medical equipment during cell phone use.[22] Incidents have been reported of medical devices affected by EMI (e.g., ventilator malfunctions, overdelivery of medication from an infusion pump), but overall the incidence of EMI adversely affecting patient care appears low.[18] Laboratory tests of 76 types of medical equipment often found in the OR and intensive care unit determined that 85 percent of the tested equipment showed no interference from mobile device signals.[63]

The specific effect and degree of interference depends on the technology and separation distance.[61] Many authors suggest that mobile phone use further than approximately three feet (1 meter) away from medical equipment should not create critical EMI.[8,18,23,62-65] If there is a question as to the proximity of mobile information technology use and its interference with a particular piece of medical equipment, the equipment manufacturer should be consulted. Clinicians should partner with the facility's biomedical engineering department to evaluate whether any risk to patient safety exists. Facilities may institute policies limiting the use of mobile information technology by clinicians or patients in certain areas of the facility.

Summary

Mobile information technology will continue to advance and provide numerous advantages to clinicians in the delivery of patient care. The healthcare team drives the change in practice to integrate new technology in a constructive and valuable way to optimize patient care. The AANA supports integration of mobile information technology and encourages CRNAs and other healthcare providers to embrace new technology in their clinical practice. Appropriately used technology can facilitate patient-related communication, documentation of care, and evidence-based practice, and improve practice efficiency and outcomes. Any clinician using mobile information technology must be aware of the effect of technology use on patient safety and minimize interruptions and distractions. Facilities and clinicians that use information technology must continue to maintain vigilance, patient safety, patient privacy, and infection control.

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