

INS Position Paper

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Recommendations for Improving Safety Practices With Short Peripheral Catheters

BACKGROUND

The short peripheral catheter (SPC) is the most common vascular access device used in the health care arena. That use is growing every year, with approximately 330 million SPCs sold in the United States in 2012. The projected growth in the US population, along with an aging population and rising morbidity rates, will contribute to an increased need for vascular access devices and infusion therapy.^{1,2}

The placement of an SPC is invasive but perceived as a simple treatment procedure. For this reason, placement is performed without consideration for the health care practitioner (HCP) and patient safety as well as the associated risks for potential complications. Reports of lawsuits against nurses involving SPC placement and resulting patient injuries are increasing, with a reported average paid indemnity of over \$100,000.³ Reports of increased blood occupational exposure during placement of SPCs are well documented.^{4,5}

SPC practices, HCPs' skill and experience, techniques, and knowledge vary across the health care spectrum. This lack of standardization and knowledge directly affects the HCP and patient safety risks as well as outcomes related to the use of SPCs.⁶ The Infusion Nurses Society (INS) conducted a survey of its members and select chapter members of the Oncology Nursing Society (ONS), and through social media in an effort to identify, understand, and validate HCP and patient safety issues, placement practices, and risks associated

with SPCs.⁷ Results from the survey provided practice information on preinsertion assessment and placement, assessment and monitoring, and education and training involving SPCs.

With these safety concerns in mind, in 2013 INS convened a task force of infusion therapy experts from various practice settings to identify, promote, and develop recommendations and tools to improve HCP and patient safety practices surrounding the use of SPCs.

DISCUSSION

Knowledge of and insertion practices for the SPC vary greatly, though the SPC is the most commonly used vascular access device in all health care settings. The insertion of an SPC is frequently viewed as a "simple" procedure any HCP should be able to perform. Often, registered nurses (RNs) and other HCPs do not receive formal education and training related to the all-encompassing practice of SPCs (preinsertion, insertion, postinsertion). In the 2013 INS IV Safety Practice Survey results (n = 345), 57% of the surveyed nurses reported not being taught how to insert an SPC while in nursing school; 71% of nurses reported receiving "on-the-job training," and 11% reported the "see one, do one" approach upon employment.⁷ A review of literature indicates the lack of a standardized nursing school curriculum on SPC; a lack of specific SPC employee orientation and preceptorship programs; and limited or no ongoing training and competency assessment, which affects HCP and patient safety and clinical outcomes.^{1,8} The survey results and the literature validate the lack of basic SPC education and training. Additionally, ongoing education

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and training are needed to increase knowledge about safety practices, infection prevention issues, complication risks, troubleshooting measures, SPC technology, and need for compliance monitoring of these devices. A key educational component and safety issue is the need to provide thorough patient/caregiver education related to preinsertion, insertion, postinsertion, and removal of an SPC. Educating the patient and/or caregiver provides another safety net in early recognition of potential complications and interventions and builds a relationship of trust between the patient and the HCP.

For 40 years, INS has provided the standards of practice relevant to SPCs, including site selection, use of local anesthesia for placement, site preparation/placement, stabilization, site care/maintenance, removal, Standard Precautions, and infection control.⁹ Even with these standards guiding SPC practice, there are significant variances in practice that affect HCP and patient safety and lead to poor clinical outcomes. These practice variances include, but are not limited to, poor aseptic/insertion technique; limited skill/knowledge in choosing the appropriate site/vein/catheter; inadequate or inappropriate use of Standard Precautions and personal protective equipment (PPE), leading to blood exposure risks and inadvertent environmental contamination of blood; inadequate catheter stabilization; inadequate patient education; and incomplete documentation of SPC insertion procedure, site assessment, monitoring, and patient education.

Prior to SPC placement, several HCP and patient-related safety factors must be considered to minimize risks. Although RNs and other HCPs are aware of certain considerations, such as avoiding areas of flexion, type of infusate, duration of therapy, catheter gauge, and venous status, in practice, many RNs and HCPs need to take the time to perform a preinsertion assessment to avoid the potential for complications.¹⁰ Areas of flexion carry a high risk for potential adverse events due to the superficial presentation of nerves and arteries and have been the basis for malpractice litigations against nurses.¹¹ Complications that may result when using an area of flexion include phlebitis, infection, infiltration/extravasation, arterial puncture, and nerve injury.^{7,12}

Poor aseptic technique and infection prevention practices increase the patient's risk for development of a local or systemic infection. Hand hygiene is to be performed before and after any interaction with an intravascular catheter.¹³ Appropriate skin preparation requires due diligence to the type of antiseptic agent being used, method of application, and contact time.⁷ Often seen in practice is a single swipe of an alcohol prep pad across the skin. Another common substandard practice is repalpating the vein with clean gloves or bare hands after the skin preparation. The *Infusion Nursing Standards of Practice* states that if the HCP needs to

repalpate the vein after the skin prep, then it must be done with sterile gloves.⁹ Unless aseptic technique is maintained, guidelines from the Centers for Disease Control and Prevention (CDC) state that palpation should not be performed after the antiseptic has been applied.¹³

SPC stabilization is often inadequate or is not done, posing a risk for several complications such as loss of access, treatment delays, infection, and infiltration/extravasation. Documented evidence supports the benefits of using a stabilization device or system to minimize complications.^{9,14} The *Infusion Nursing Standards of Practice* and the *ONS Access Device Guidelines* recommend the use of stabilization/securement devices; however, the INS IV Safety Practice Survey results showed that only 46% of the nurses surveyed reported using a stabilization device in actual practice.^{9,15,16} SPC infection rates are thought to be low, though actual infection numbers could be relatively high, with most going undetected because of short dwell time and early discharges.⁷

Patients with difficult-to-find veins for venipuncture remain a challenge for HCPs. Multiple failed insertion attempts are distressing to patients and their families, may cause treatment delays and increased costs, and may necessitate a central venous catheter placement associated with additional complication risks.^{17,18} Ultrasound and infrared light technologies have been reported to increase first venipuncture success rates and patient satisfaction.¹⁹⁻²⁵ Though both technologies are proving to be safe and efficient for difficult access patients, only 24% of the INS IV Safety Practice Survey respondents indicated that they use such devices.⁷ Ultrasound and infrared light technologies have been reported to show a positive benefit, but the standard of care is in the developmental stage and has not yet evolved.¹⁵

Occupational blood exposure potentially leading to blood-borne pathogen (BBP) transmission during the insertion, care, and removal of an SPC places the HCP at risk. Even though regulatory agencies and standards of practice require HCPs to use Standard Precautions, safe work practices, and PPE when occupational exposure is highly feasible, there is evidence of inadequate, inappropriate, or lack of use of Standard Precautions and PPE.⁶ In 2011, the published results of 2 surveys assessed the risk of blood exposure with SPC insertion. Jagger and colleagues⁴ noted that 1 in 2 nurses experienced blood exposure on skin or mucous membrane due to splash, splatter, or leakage. Nurses also reported not wearing gloves 10% to 11% of the time when inserting an SPC.^{4,5} Some HCPs have reported wearing gloves but cutting the finger out of the glove to palpate ("feel") the vein, which negates the safety benefit of the glove. In addition, because of blood leakage or splatter on the gloves during the procedure, inadvertent environmental contamination occurred, exposing others

to the potential for BBP transmission.⁴ Understanding, using, and implementing safe practices in the form of Standard Precautions should be one of the primary safety strategies used when blood or body fluid exposure is anticipated to help prevent the risk of BBP transmission.^{6,26}

The 2012 INS position paper “Recommendations for Frequency of Assessment of the Short Peripheral Catheter Site” forms the basis for the assessment and monitoring of the indwelling SPC, including verifying ongoing need of the device and clinical indications to remove or rotate.²⁷ It has been reported that a situation most likely to result in a serious adverse event for the patient and HCP is incomplete assessment or failure to frequently assess, monitor, or maintain the SPC site. The results of 516 closed claim analyses and risk control assessments identified assessment and monitoring as 2 of the common allegations. Of those claims, 13.2% were due to HCP failure to properly monitor or maintain the infusion site, which resulted in severe complications, such as compartment syndrome and infection. Documentation of SPC placement, assessment, and monitoring is consistently lacking and ignored. As litigation brought against HCP increases, careful documentation, as outlined in the organization’s policies and procedures, will help prove that the care provided met the standards of practice.³

Data collection and surveillance of SPC outcomes and device-related adverse events are currently lacking. RNs, HCPs, and organizations recognize that there is a need to develop tools and processes to assist in this endeavor, but the magnitude of the number of SPCs sold and used presents a formidable challenge to moving this process forward. Yet it is an endeavor needed to understand SPC practice and raise awareness about patient and HCP safety issues associated with SPCs. Infusion therapy is one of the most invasive, high-risk procedures HCPs perform. Because it is such a common procedure, it is easy to forget the potential for serious patient complications and safety risks to the patient and HCP.

DEFINITIONS

1. *Catheter stabilization device*: device/system specifically designed and engineered to control movement at the catheter hub, thereby decreasing catheter movement within the vessel and risk of catheter malposition.
2. *Extravasation*: inadvertent infiltration of a vesicant solution/medication into surrounding tissue.
3. *Health care practitioner (HCP)*: refers to individuals in medical, nursing, dental, and health professions including pharmacy, respiratory therapy, physical and occupational therapy, as well as paramedics, emergency medical technicians, and other health care assistive personnel.
4. *Infiltration*: inadvertent administration of a nonvesicant solution/medication into surrounding tissue.
5. *Personal protective equipment (PPE)*: specialized equipment worn by an individual for protection against health and safety hazards; examples include, but are not limited to, face masks, caps, goggles, gloves, drapes, and fluid-resistant gowns.
6. *Phlebitis*: inflammation of a vein; may be accompanied by pain, erythema, edema, streak formation, and/or palpable cord.
7. *Short peripheral catheter (SPC)*: a type of vascular access device where the tip begins and terminates in a peripheral vein varying in sizes; usually less than 3 inches in length.
8. *Vesicant*: an agent capable of causing blistering, tissue sloughing, or necrosis when it escapes from the intended vein pathway into surrounding tissue.

STATEMENT OF POSITION

It is the position of the Infusion Nurses Society to promote and ensure safe practices for the HCP and the patient and that:

1. A fundamental element for performing a procedure correctly is to have adequate knowledge of the correct steps to follow. All registered nurses and HCPs who are responsible for SPC placement, assessment, monitoring, and removal should attend and successfully complete an educational (theoretical/didactic) program specific to SPC during orientation (hire) and at least annually.
2. Knowledge alone doesn’t translate to a change in practice; therefore, education/training should be followed by an SPC competency assessment that includes return demonstration with a qualified preceptor/instructor and observation audits with direct feedback annually and as needed.
3. An organization’s policies and procedures for short peripheral catheter should be developed/reviewed and/or revised to incorporate the most current standards of practice from INS and CDC guidelines to include:
 - a. Preinsertion assessment and placement
 - b. Ongoing assessment and monitoring of indwelling SPCs
 - c. Infection prevention and Standard Precautions
 - d. Identification, prevention, and management of complications
 - e. Patient/caregiver education
 - f. Removal of SPC
 - g. Documentation
 - h. Surveillance/quality improvement/outcomes
4. Development of SPC surveillance programs with “quality indicators” that will allow objective assessment and monitoring of SPCs. The indicators may include, but

are not limited to, phlebitis rate; SPC infection rate; infiltration/extravasation rate; timely and accurate documentation of placement; daily review of SPC necessity; compliance to Standard Precautions during insertion, maintenance, and removal.

5. Audits and feedback should complement the SPC surveillance program to sustain improvement in process and performance. Direct feedback during SPC insertions or review of SPC sites and documentation can assist in practice change.
6. Personal protective equipment (PPE), hand hygiene, and safe injection practices form the basis of Standard Precautions. Due to the high risk of occupational blood exposure with the SPC procedure, PPE must be used and selected if the potential for blood or body fluid exposure is anticipated or highly feasible.
7. The placement of an SPC is a procedure performed by both the infusion nurse and the non-infusion nurse. It is strongly recommended that the insertion, care, and maintenance of SPCs is implemented as a standardized curriculum in all undergraduate nursing programs to provide novice nurses with basic knowledge/skills as they join the nursing work force.
8. Develop and implement an effective method to focus and improve safety compliance to include safety awareness campaigns on a regular basis.
9. Incorporate vein visualization technology as a routine strategy for patients with difficult or poor venous access. Visualization technology can improve success rates, decrease unsuccessful insertion attempts, and improve patient satisfaction.

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