

Emergency Nurse Practitioners' Knowledge and Skill Competence in Point-of-Care Ultrasound (POCUS) for the Diagnosis of Skin and Soft Tissue Infections (SSTIs)

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Structured Abstract

LOCAL PROBLEM

The number of ambulatory and emergency department (ED) visits for skin and soft tissue infections (SSTIs) have doubled over the past two decades, accounting for more than 14 million visits annually in the United States. The two most common SSTIs, abscess and cellulitis, have a similar appearance on physical exam, creating clinical uncertainty for the treating provider. Point-of-care ultrasound (POCUS) has been identified as a valuable tool in the diagnosis of SSTIs and is superior to physical examination alone in accurately diagnosing SSTIs in both adult and pediatric patients. Moreover, the use of POCUS in patients with suspected SSTIs has shown decreased clinical failure rates compared to treatment without POCUS. Evidence-based guidelines for the treatment of abscess recommend incision and drainage (I&D), whereas cellulitis is typically treated with antibiotics. Given the differing treatment modalities, accurate diagnosis of SSTIs is essential. Misdiagnosis of SSTIs can lead to unnecessary invasive procedures, sedation, inappropriate use of antibiotics, complications, subsequent visits, inappropriate referrals, and increased healthcare costs. With limited availability of emergency nurse practitioner (ENP) academic and fellowship programs, many enter the field with little to no experience in required skills such as POCUS. Moreover, entry-level ENPs rely heavily upon on-the-job training. Although both diagnostic and procedural ultrasound are included within the practice standards of ENPs, few ENPs in the local setting identified are trained in this skill. Therefore, an educational skills workshop and tool kit are needed for ENPs to ensure competent care and provide a means of evaluation of proficiency by supporting measurable outcomes that can be utilized to evaluate ENPs use of POCUS for the diagnosis of SSTIs.

PROJECT PURPOSE

The purpose of the project is to assess ENPs' knowledge and skill competence in the use of POCUS for the diagnosis of SSTIs and to develop an educational workshop and toolkit with the aim of increasing provider competence and improving patient outcomes.

METHODOLOGY

The project plan development was guided by the Diffusion of Innovations Theory. The theoretical model was developed by Dr. Everett Rogers is used to describe how an innovation advances over time. The Diffusion of Innovation Theory is composed of 5

steps: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. The theory projects the adoption of ultrasound by ENPs for the diagnosis and management of SSTIs. An educational workshop was provided to ENPs in accordance with the 2019 Competencies for Nurse Practitioners in Emergency Care and the Scope and Standards for Emergency Nurse Practitioner Practice. Workshop curriculum was adapted from several MedEdPORTAL lectures and modified to meet the specific educational needs of the identified population. The educational activity consisted of a ninety-minute workshop including a didactic component followed by instructor demonstration and simulation of POCUS. Prior to the course, each participant completed a pre-course assessment designed to determine each participant's knowledge of POCUS. Following completion of the workshop, participants completed a post-course evaluation. Workshop participants were also be provided with a POCUS Toolkit for ENPs. Lastly, participants completed a post-course survey 2-4 weeks after the conclusion of the workshop to assess for practice change and impact on patient outcomes.

RESULTS

Fifteen nurse practitioners working in emergency and urgent care attended the workshop. Years of experience ranged from 1-25 years. Based on the pre-course assessment, 40% reported receiving prior training in POCUS, 73% reported that they did not feel confident in their knowledge and skills in POCUS, and 93% felt that lack of training was a barrier to using POCUS in practice. Following the workshop, 86% of participants reported increased confidence in their knowledge and skills in POCUS, and 100% of participants recommended that all ENPs receive this training. Following completion of the 2-week follow-up survey, 53.3% of participants reported that they had utilized POCUS in practice and were able to successfully identify an abscess and perform I&D. In addition, 40% reported that the addition of POCUS benefited their practice and has the potential to improve patient outcomes.

IMPLICATIONS FOR PRACTICE

POCUS should be incorporated as the standard of care for routine evaluation of SSTIs. POCUS has the potential to improve diagnostic accuracy of SSTIs and decrease clinical failure rates. This could lead to decreased complications and healthcare costs while increasing antibiotic stewardship and potentially improving patient outcomes and satisfaction. Although POCUS has been described as a skill that is easy to learn, its utility is dependent upon sonographer competence. Therefore, adequate training must be provided to ensure provider competence and the delivery of high-quality, evidence-based care.

Keywords: point-of-care ultrasound, emergency nurse practitioner, skill competence, skin and soft tissue infections

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