Australasian Emergency Nursing Journal (2016) 19, 20—25

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/aenj

RESEARCH PAPER

Utility of peripheral intravenous cannulae inserted in one tertiary referral emergency department: A medical record audit

Margaret Fry, NP, PhD, RN [a,*]
Bernadine Romero, BN, Grad Cert(Emergency Nursing) [b,d]
Alison Berry, BN, Grad Cert(Leadership and management in Health) [c,e]

[a] *Director of Research and Practice Development, Northern Sydney Local Health District, Faculty of Health, University of Technology Sydney, Australia*
[b] *CNC Emergency Department, St George Hospital, South Eastern Sydney Local Health District, Australia*
[c] *Clinical Nurse Specialist Emergency Department, St George Hospital, South Eastern Sydney Local Health District, Australia*

Received 13 July 2015; received in revised form 17 October 2015; accepted 26 October 2015

KEYWORDS
Emergency service, hospital;
Catherization, peripheral;
Medical audit;
Clinical audit;
Infusions, intravenous

Summary
Introduction: Peripheral intravenous cannulation is a common intervention performed within the Emergency Department (ED). However, studies have shown that while patients may have a cannulae inserted they are often unused. Across Australia, it is unclear the frequency and use of peripheral intravenous cannulae (PIVC) within the emergency setting.
Method: A one-month retrospective randomised medical record audit of adult patients was conducted. Data were retrieved from the ED electronic database and the paper medical record. Data included: patient demographic (age, gender) and clinical information (time of arrival, triage category, presenting problem, discharge diagnostic code, and disposition) and cannula usage (time of fluids, pharmacological agents, pathology, radiological investigations, other diagnostic uses).

* Corresponding author at: Research and Practice Development, Nursing and Midwifery Directorate, Northern Sydney Local Health District, Level 7 Kolling Building, Royal North Shore Hospital, St Leonards, NSW 2065, Australia. Tel.: +61 2 9926 4693.
E-mail addresses: margaret.fry@uts.edu.au (M. Fry), bernadine.romero@sesiahs.health.nsw.gov.au (B. Romero), alison.berry@sesiahs.health.nsw.gov.au (A. Berry).
[d] Tel.: +61 02 91131655.
[e] Tel.: +61 02 91131680.

http://dx.doi.org/10.1016/j.aenj.2015.10.003

Results: Of the 357 patients, 209 (58.5%) had a peripheral intravenous cannula inserted. Of the 209 patients a total of 233 cannulae were inserted. Of the patients with a cannulae 190 (90.9%) were used within 72 h. The majority of cannulae (68.9%; $n = 131$) had more than one medical intervention.
Conclusion: The majority of PIVCs inserted during the ED visit were used for medical treatment. The majority of devices were used for intravenous fluids medications and were accessed for multiple interventions. For future audit purposes improved documentation of this procedure is needed.

What is known

- Insertion of peripheral cannulae can lead to inappropriate adverse patient outcomes.
- Inappropriate insertion of peripheral cannulae can result in significant costs and utilisation of resources and staff time.
- EDs frequently insert peripheral cannulae that are not utilised within the ED stay inappropriately.

What this paper adds?

- In contrast to existing literature the insertion of peripheral cannulae was appropriate within one tertiary referral ED.
- The majority of ED peripheral cannulae were used for multiple medical interventions.
- Peripheral cannulae documentation by operator, site and attempts was poor.

Introduction

Over a billion peripheral intravenous cannulae (PIVCs) are inserted worldwide each year for health care purposes.[1] Peripheral intravenous cannulation is a common intervention performed within the Emergency Department (ED). The purpose of inserting a PIVC is to obtain intravenous access to provide treatments for patients, such as those requiring the administration of pharmacological agents, intravenous fluids or pathology blood tests. Commonly across Australian EDs PIVCs are often inserted during the initial nursing assessment for the purposes of clinical pathways and or the collection of pathology investigations as a preventative measure to avoid a secondary needle puncture. However, it is unclear whether the insertion of a cannula is subsequently used for additional medical interventions.

The insertion of PIVCs has significant human resource, patient and cost implications for any health service. This is particularly so if the PIVC is unnecessary as staff time is wasted, patients are placed at risk and the cost of equipment for an ED over a 12-month period can be substantial.[2] Therefore, the aims of the study were to explore the (i) prevalence of PIVC insertion in adult patients presenting to one ED; and (ii) trends, patterns and documentation of usage of PIVCs within 72 h.

Background

PIVC insertion is a routine ED intervention carried out by senior nursing and medical staff to help facilitate the care and treatment of patients. Across Australia, ED nurses regularly initiate and undertake many extended practices, including PIVC insertion.[3–5] These extended activities have been in response to increased workload and overcrowding.[6,7]

Often in the ED PIVCs are inserted concurrently with obtaining blood samples as they enable the removal of a patient's blood for pathology testing. In other clinical areas and general practice a patient will usually have their blood withdrawn using a syringe and or vacutainer needle. However, in the ED inserting a PIVC and obtaining a blood sample is viewed as avoiding a second needle puncture for the patient should they subsequently require intravenous treatments.[8–10]

A recent Australian ED study identified that 50% of intravenous cannulae inserted were unused or unwarranted.[11] Similarly, a study conducted by Henderson et al.,[9] identified that when PIVC access was initiated in the ED, only 42.2% (ambulance patients) and 48% (self-presenting patients) respectively had their PIVCs used. They also identified that 71.3% of the unused PIVCs in the ED were used only for pathology specimen acquisition.

Approximately 80% of hospitalised patients have a PIVC inserted at some point during their acute stay.[12] The insertion of PIVCs has been associated with patient complications such as pain, discomfort, thrombophlebitis, infections and potentially sepsis.[2,13,14] One of the more common organisms associated with PIVC sepsis is *Staphylococcus aureus* bacteremia (SAB). SAB is commonly a hospital-acquired infection that is often associated with indwelling medical devices such as PIVCs. Stuart et al. note that SAB associated PIVC infections were associated with a mortality rate of 26.5%. Consequently, PIVC associated infections pose a risk to patients and significant financial cost to the healthcare system due to increased length of stay, additional antimicrobial treatment and resources required to treat the infection. According to Stuart et al., SAB costs may be as high as $20,000 per patient. These costs and adverse health outcomes may be preventable if the PIVC was avoidable.

Exploring the ED prevalence and utility of PIVCs could identify areas for service improvement.[6,7,10] More importantly, the exploration of the use of PIVCs in Australian EDs has the potential to reduce costs and staff time while optimising patient outcomes and treatment. By exploring the insertion and usage of PIVCs, we may be able to ensure the