



Systematic Review

A systematic review of the impact of nurse-initiated medications in the emergency department

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ARTICLE INFO

Article history:

Received 30 January 2017

Received in revised form 16 March 2017

Accepted 3 April 2017

Keywords:

Nurse-initiated

Emergency nursing

Emergency department

Overcrowding

ABSTRACT

Background: Nurse-initiated medications are one of the most important strategies used to facilitate timely care for people who present to Emergency Departments (EDs). The purpose of this paper was to systematically review the evidence of nurse-initiated medications to guide future practice and research. **Methods:** A systematic review of the literature was conducted to locate published studies and Grey literature. All studies were assessed independently by two independent reviewers for relevance using titles and abstracts, eligibility dictated by the inclusion criteria, and methodological quality.

Results: Five experimental studies were included in this review: one randomised controlled trial and four quasi-experimental studies conducted in paediatric and adult EDs. The nurse-initiated medications were salbutamol for respiratory conditions and analgesia for painful conditions, which enabled patients to receive the medications quicker by half-an-hour compared to those who did not have nurse-initiated medications. The intervention had no effect on adverse events, doctor wait time and length of stay. Nurse-initiated analgesia was associated with increased likelihood of receiving analgesia, achieving clinically-relevant pain reduction, and better patient satisfaction.

Conclusion: Nurse-initiated medications are safe and beneficial for ED patients. However, randomised controlled studies are required to strengthen the validity of results.

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Introduction

Emergency departments (EDs) provide care for people who require urgent medical attention. These departments are a critical component of our health-care system with 7.5 million presentations to Australian public hospital EDs in 2015–16 [1]. People presenting with an acute medical event may need timely treatment, frequently requiring administration of medications to relieve their symptoms. The time to administration of medications is often seen as a quality of care indicator [2] and contributes to patients' perceptions of the care they receive in the ED [3]. However, timely administration of medications in the ED environment continues to provide a challenge for clinical staff working in busy and often overcrowded EDs [4]. A literature review by Bernstein et al. [5] revealed some of the known effects of overcrowding, which were delayed administration of antibiotics for patients with pneumonia,

late initiation of thrombolytic therapy for patients with myocardial infarction, and longer time-to-analgesia.

Nurse-initiated medications have been one of the most important strategies implemented in EDs to facilitate timely care [6]. The process involves giving nurses the autonomy to administer medications to patients as guided by their medical condition prior to them being seen by an ED doctor [7].

Evidence from the literature shows that analgesia [8–19], bronchodilators [20–22], and thrombolytics [23–25] have been nurse-initiated in EDs. The practice has been utilised in several countries such as Australia [8,10,11,13,16–19,26], United States [12,14,21], Sweden [27,28], Canada [20], Hong Kong [22], and United Kingdom [23–25]. The uptake of nurse-initiated medications in the ED is increasing; therefore it is pertinent to evaluate the impact of this practice on important quality of care indicators, which are safety, timeliness, effectiveness, equitability, patient-centred care, and efficiency [29]. The findings of this review have the potential to, influence further up-take of nurse-initiated medication administration and direct future research.

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Table 1
The six quality of care domains proposed by the Institute of Medicine.

Safety	avoiding injuries to patients from the care that is intended to help them. Example outcome measures are adverse events, left without being seen, morbidity, or mortality.
Timeliness	defined as reducing waits and sometimes harmful delays for both those who receive and those who give care. Timeliness is measured using time-based outcomes such as time to first medication administration.
Effectiveness	defined as providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit, for example clinical improvement.
Equitability	refers to providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status. Outcome measures include accessibility or availability of medications.
Patient-centeredness	providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions. Outcomes can include patient satisfaction or patient perceptions of the care received in ED.
Efficiency	focuses on avoiding waste, including waste of equipment, supplies. Outcome measures that fall under efficiency are length of ED stay or the rate of inpatient admission.

Objectives

The objectives of this review were to: systematically review the literature evaluating the effects of nurse-initiated medications in the emergency department; and to quantify the impact of the practice on quality of care indicators (i.e. safety, timeliness, effectiveness, equitability, patient-centred care, and efficiency).

Methods

Inclusion criteria for this review

Types of studies

The review included experimental studies, such as randomised controlled trials (RCT), quasi-experimental or controlled before-and-after studies that evaluated the effectiveness of nurse-initiated medications in the ED. Observational studies were not included in this effectiveness review [30] due to the inherent bias and confounding factors that could obscure the true effect of nurse-initiated medications [31,32].

Types of participants

Participants were paediatric and adult patients who sought care in the ED.

Types of interventions

Nurse-initiated medications is a component of non-medical pre-prescribing, where a list of medications is pre-approved (such as in a formulary or protocol), can be given according to the patient's condition, and signs and symptoms, and administered without a medical order [7]. The nurse-initiated medication must be given in ED and by ED nurses.

Types of outcome measures

The outcomes were categorised according to the quality of care domains in ED, safety, timeliness, effectiveness, equitability, patient-centeredness, and efficiency (Table 1) [29].

Table 2
Search strategy for published studies.

Database	CINAHL via Ebsco
Dates	Inception to July 5, 2016
Keywords:	
1. TX emergency department OR TX (accident and emergency)	85,176
2. TX medication\$ OR TX drug\$ OR TX "medication protocol" OR TX "drug protocol" OR TX protocol	695,708
3. TX "nurse initiated" OR TX "nurse managed" OR TX "nurse prescribing" OR TX "non medical prescribing"	9564
4. TX nurse OR TX nursing	1,211,525
5. 1 AND 2 AND 3 AND 4	869
Database	PubMed
Dates	Inception to July 5, 2016
Keywords:	
1. emergency department OR TX (accident and emergency)	186,325
2. medication* OR drug* OR "medication protocol" OR "drug protocol" OR protocol	5,330,388
3. "nurse initiated" OR "nurse managed" OR "nurse prescribing" OR "non medical prescribing"	1208
4. nurse OR nursing	740,859
5. 1 AND 2 AND 3 AND 4	39
Database	EMBASE
Dates	Inception to July 5, 2016
Keywords:	
1. 'emergency'/exp OR emergency AND department OR 'accident'/exp OR accident AND ('emergency'/exp OR emergency)	278,464
2. medication* OR drug* OR 'medication protocol' OR 'drug protocol' OR protocol	9,934,833
3. 'nurse initiated' OR 'nurse managed' OR 'nurse prescribing' OR 'non medical prescribing'	1475
4. 'nurse' OR 'nursing'	853,533
5. 1 AND 2 AND 3 AND 4	72

Search methods

The search strategy, as shown in Table 2, was used to yield published studies and the grey literature from the start of the database until July 5, 2016 and in any language. Published studies were obtained from CINAHL, CENTRAL, PubMed, and EMBASE, while Grey literature were sourced from Web of Science, OpenGrey, and ProQuest Dissertations and Theses. Additional studies were also located in clinical trials registries and hand-searching in the references of relevant studies.

Data collection and analysis

Selection of studies

Selection of studies was done independently by two independent reviewers. Any disagreements between Reviewer 1 (CJC) and 2 (MB) were discussed and resolved. All citations from the final search strategy were imported into referencing software and subsequently screened for relevance using title and abstract. Then, the full-text of relevant citations were retrieved and assessed for eligibility based on the inclusion criteria. Lastly, all eligible studies were appraised for methodological quality using the Effective Practice and Organisation of Care Group risk of bias criteria [33].

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