

# **Effectiveness of an advanced practice emergency nurse role in a minor injuries unit**

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## **KEY WORDS**

Emergency Service, Emergency Department, Patient Discharge, Advanced Nursing Practice, Emergency Nursing, Patient Discharge Education.

## **ABSTRACT**

### **Objective**

To evaluate the effect of an emergency department discharge initiative (EDDI) nurse on discharge processes and patient transition outcomes.

### **Design**

Prospective comparative study of two groups of patients, aged 18-70 years discharged from a minor injuries unit.

### **Setting**

Emergency Department Minor Injuries Unit at a large tertiary hospital in South East Queensland, Australia.

### **Subjects**

In total 337 patients were eligible and 231 were included in the study. Participants were recruited into two groups one before the introduction of the intervention (n= 103) and one after the introduction of the intervention (n=128).

### **Intervention**

Introduction of an EDDI nurse (an advanced practice role) focusing on improving patient pre-discharge care and transition home.

### **Main outcome measures**

Data were collected pre-discharge and one week post discharge, using self reports of discharge planning processes and the Care Transitions Measure (CTM) Questionnaire.

### **Results**

Patients seen by the EDDI nurse were significantly more likely to receive written discharge information, a discharge letter, information on equipment, information on medication side effects and have follow-up arranged, than those not seen. The intervention group also had a better understanding of post discharge healthcare management with a mean CTM score of 83.3 out of a possible 100 compared with the pre-intervention mean of 64.4. ( $p < 0.001$ ).

### **Conclusions**

The introduction of an EDDI nurse in the minor injuries unit improves discharge information provision and follow-up and leads to an improvement in post-hospital care transition from the patient's perspective.

## INTRODUCTION

Recently, various expanded or advanced practice roles for nurses in the Emergency Department (ED) have been developed (for example, Nurse Practitioner, Specialised Emergency Nurses or Advanced Practice Emergency Nurses) and there is a growing body of evidence that suggests these roles are both effective and acceptable to patients (Wilson and Shifaza 2008; Carter and Chochinov 2007; Derksen et al 2007). These advanced practice roles mainly focus on managing patients with minor injuries and have been evaluated based on process and service outcome measures such as the rate of patients who left without being seen, patient waiting times, patient satisfaction and cost, compared to medical officer care (Wilson and Shifaza 2008; Derksen et al 2007; Nash et al 2007). One systematic review of nurse practitioners in the ED included studies that assessed the quality of care, as well as these other variables, and concluded, 'The results of this review suggest the addition of a staff member dedicated to seeing minor treatment patients will improve wait times for these patients as well as improve patient satisfaction, with little or no impact on quality of care' (Carter and Chochinov 2007, pp. 294).

One of the key elements of care for patients being treated for minor injuries in an ED is discharge planning that incorporates the provision of information to assist with transition home and self-care once discharged. Hospital discharge planning is credited with such beneficial effects as reduced length of hospital stay, improved quality of home care, increased patient satisfaction and a reduction in unplanned hospital readmissions (Holland et al 2003; Payne et al 2002; Parkes and Sheppard 2001; Driscoll 2000; Naylor 2000). Contributors to unexpected readmissions include sub-optimal medical management, lack of sufficient home support, failure to comply with prescribed therapy and unexpected side effects of medications (Einstadter et al 1996). In the ED, use of multidisciplinary teams for discharge planning has been shown to reduce the rate of readmission to hospital for at risk groups (Moss et al 2002). However, few studies of advanced practice nursing roles in ED focus on discharge planning and patient transition.

EDs vary widely in the information given to patients on discharge (Taylor and Cameron 2000a). Studies have demonstrated that patient recall and understanding of diagnosis, treatment and follow up plans are poor (Taylor and Cameron 2000b). The compliance of recently discharged emergency patients is directly related to their comprehension (Clarke et al 2005). Poor comprehension may be due to the stressful environment of the emergency department, poor English or reading ability or the desire to leave quickly after a long wait (Clarke et al 2005). A research study of patients discharged from an emergency short stay unit found they felt they received adequate information and were satisfied with the level of care, however, a large proportion still required subsequent medical care for the presenting problem after discharge (Arendts et al 2006). A preliminary audit in the Gold Coast Hospital emergency department (ED), undertaken as part of in-house quality control processes, suggested that many patients received inadequate information prior to discharge and that discharge processes had room for improvement.

Patient understanding of self care instructions and the quality of the patient's transition from hospital to home are difficult to quantify. To date there have been few measures developed that focus on this transition from the patient's perspective (Coleman et al 2005). In 2005 an American research team developed a measure called the Care Transitions Measure (CTM) which was based on four focus group derived domains. These domains relate to how well patients understood and felt capable of managing aspects of their own care once discharged. It was found to be able to discriminate between patients discharged from hospital that did and did not require a subsequent ED visit (Coleman et al 2005). While the CTM was developed based on data from older adults

discharged from medium stay units rather than ED patients, it is currently being applied to a broad range of populations by over 1000 different groups of clinicians and researchers. The WHO Regional Office for Europe is sponsoring a hospital quality improvement project that will incorporate the CTM in the indicator set to be used in up to 200 hospitals in 10 countries (Coleman et al 2007).

The quality of transition to home and the nurse's role in discharge planning for patients admitted to ED are rarely explored in the literature. Patients treated in a minor injuries unit may easily have their individual discharge needs overlooked as, by the nature of the unit, patient stays are of short duration. While the use of a multidisciplinary team for discharge planning may reduce the rate of readmission to hospital for at risk patients (Moss et al 2002), lack of clarity as to who is responsible for discharge planning and patient education as well as time pressures may hinder effective discharge processes (Watts and Gardner 2005; Guttman et al 2004). Clarifying responsibility for aspects of care with other members of the health team is important in order to provide optimal care and prevention of harm (ANMC 2006). Studies have identified the need for a key worker, such as a transition nurse, to ensure successful co-ordination of post-discharge services (Bristow and Herrick 2002; Einstadter et al 1996).

The purpose of this study was to evaluate the effect of an emergency department discharge initiative (EDDI) nurse on discharge processes and patient transition outcomes. Specifically, the intervention focussed on the provision of discharge information, the provision of work certification and the arrangement of follow-up appointments with other health care providers.

## **METHOD**

This was a prospective, comparative study incorporating a before and after design. The study was undertaken in the emergency department of the Gold Coast Hospital (GCH), a major metropolitan hospital on the east coast of Australia. The department sees 65,000 patients per year and serves a large local population of over 500,000 as well as a seasonal influx of tourists.

The minor illness and injury unit is geographically separate from the main emergency department and has been operational since 2004. It is typically staffed from 0730 hours to 2230 hours with one to two doctors and a nurse. The unit sees an average of 40 patients per day. Patients are allocated to the unit by a triage nurse on the basis of specific criteria. Patients attending the unit are primarily discharged following treatment.

### **Participants**

All patients treated in the minor illness and injury unit and discharged to their place of residence, between the hours of 0800 to 1600 Monday to Friday, were eligible for the study. Mental health patients and patients less than 18 years of age or over 70 years of age were excluded as they were managed in different areas or by different teams.

### **Intervention – Emergency Department Discharge Initiative (EDDI) nurse**

The intervention was the establishment of an Advanced Practice Nursing Role in the ED. Gardner et al (2007) developed a research informed model of the service parameters of the Advanced Practice Nursing Role that differentiates the role from Nurse Practitioner in Australia. The Advanced Practice Nurse is an experienced specialist registered nurse who has the knowledge and ability to provide expert clinical care and advice to patients (Gardner et al 2007; ANMC 2006). In this study the role was established to provide care and education to patients who were discharged from the minor

injuries unit of the ED. The EDDI Nurse had over five years of ED nursing experience and had a background in home care. This meant that he had a comprehensive knowledge base involving expertise in the care of conditions, such as but not limited to, chronic diseases, soft tissue injuries, head injuries, medication advice, alcohol and drug dependence as well as being familiar with the community services and referral agencies available.

The initial four weeks of the study comprised the pre-intervention period. During this time patients received the normal standard of discharge care. This consisted of verbal or written instructions from the emergency doctor or nurse. A discharge nurse with additional qualifications and clinical experience was available on an *ad hoc* basis but was only consulted as deemed appropriate by the medical team. For some shifts this discharge nurse was the same individual who eventually occupied the EDDI Nurse role during the intervention period.

During a second four week period (the intervention period), between the hours of 0800 and 1600 Monday to Friday, the EDDI Nurse reviewed the patients, following assessment and treatment prescription by the emergency medical team. The EDDI nurse made an assessment of the patient's needs, coordinated the episode of care and provided discharge information, medication and equipment advice and arranged follow up with other health care practitioners as appropriate.

Table 1 provides a comparison of care provided in the pre-intervention and intervention periods.

**Table 1: Comparison of roles and responsibilities for patient care in pre-intervention and intervention periods**

<b>Roles and Responsibilities for Patient Care</b>	<b>Pre-intervention</b>	<b>Intervention</b>
Patient assessment	Emergency doctor	Emergency doctor
Ordering of diagnostic tests and treatments	Emergency doctor	Emergency doctor – EDDI Nurse review
Coordination of diagnostic testing and timely review by medical team	Emergency doctor	EDDI Nurse
Provision of written instructions to assist with post-discharge self-management	Emergency doctor	EDDI Nurse
Provision of follow-up care appointments or referral to community services	Emergency doctor	EDDI Nurse
Provision of equipment e.g. crutches	Emergency doctor/Physiotherapist	EDDI Nurse
Provision of medication prescription	Emergency doctor	Emergency doctor – EDDI Nurse review
Provision of medical certificates	Emergency doctor	Emergency doctor – EDDI Nurse review

### **Data collection instruments**

Data were collected using two interview instruments (one pre and one post discharge) and a diary was given to participants to aid recall for the post discharge interview. The pre-discharge interview was developed by the research team and consisted of a 25-item checklist that focused on which information, equipment, medications, medical certificates and follow-up/referrals the patient had received and from whom. This interview was conducted by the research assistant (RA) attached to the project. The RA was trained to use the interview checklist and the first five patients were interviewed by both the RA and one of the investigators resulting in a 100% agreement in data collected.

The post discharge interview schedule included the Care Transitions Measure together with some additional items related to health care practitioner visits within the past week. The CTM focuses on patient understanding of self care instructions and discriminates between patients discharged from hospital that did and did not have a subsequent ED visit (Coleman et al 2005). The CTM is made up of 15 questions that measure the quality of preparation for care transitions (Coleman et al 2005). Responses are graded from one (strongly disagree) to four (strongly agree) and a cumulative total is translated to give a score out of 100. A higher score indicates a better 'transition' from the hospital to the community. The CTM has a high internal consistency and reliability with one study recording a Cronbach's alpha of 0.93 (Coleman et al 2005). Again the RA was trained in the administration of the CTM and the extra items related to service access.

A diary was provided to the study participants and they were asked to record any problems they had once they returned home and access to health professionals including ED representation or access to allied health/community care, or General Practitioner.

### **Data collection procedures**

Just prior to discharge patients were interviewed by the RA using the interview checklist. The RA was a nursing student who was not involved in the care of the patients. One week post-discharge the patients were interviewed, at home, by telephone at a time convenient to them. This second interview was conducted by the same RA. If the participants could not be contacted one week post-discharge attempts were continued until the tenth day. Both pre and post-intervention cohorts were blinded to their treatment group as they were informed that the study was investigating perceptions of discharge.

### **Ethical considerations**

Ethical approval was gained from the hospital Human Research Ethics Committee. A data collector consented patients at the point of discharge. Indigenous support workers and translators were available on an on-call basis.

### **Data analysis**

Data were collected and entered onto an Excel database then transferred with no patient identifiers to the SPSS statistical software program. Demographic characteristics of the sample were analysed using descriptive statistics. CTM scores between the groups were compared using Mann-Whitney U tests for non-parametric data. Other between groups comparisons were analysed using Chi square measures. The level of significance was considered to be  $p < 0.05$ .

## FINDINGS

During the study period 1,761 patients presented to the minor injuries unit. Three hundred and thirty seven patients were considered eligible for the study. Of these 70 refused to consent and were excluded. Thirty six patients were subsequently lost to follow up. In total 231 patients were included in the study, 103 in the pre-intervention groups and 128 in the post-intervention group.

The pre and post intervention groups were similar in terms of age, sex and diagnostic group (see Table 2). In addition there were no statistically significant differences in age, sex and diagnosis between study participants and those lost to follow up.

**Table 2: A comparison of the demographic characteristics and diagnostic groups of the pre and post intervention groups included in the sample**

	Pre-intervention (n=103)	Post-intervention (n=128)	p-value
Age [median (IQR)]	33 (20)	36 (26)	0.23
Male [n (%)]	66 (64.1)	80 (62.5)	0.81
Presenting condition			
Laceration, minor injury [n (%)]	48 (46.6)	73 (57.0)	0.59
Minor fracture [n (%)]	27 (26.2)	23 (18.0)	
Eye and ear problem [n (%)]	10 (9.7)	14 (10.9)	
Bites and stings [n (%)]	3 (2.9)	3 (2.3)	
Infections [n (%)]	3 (2.9)	3 (2.3)	
Minor burn [n (%)]	3 (2.9)	1 (0.8)	
Other [n (%)]	9 (8.7)	11 (8.6)	

Table 3 provides a comparison of patient discharge processes between the pre and post-intervention groups.

**Table 3: Comparison of provision of discharge planning between pre and post-intervention groups**

Discharge Planning	Pre-intervention n (%)	Post-intervention n (%)	P value
<b>Information provision</b>			
Given information specific to diagnosis	20 (19.4)	73 (57.0)	<0.001
Provided with discharge letter	13 (12.6)	84 (65.6)	<0.001
Provided with verbal information	89 (86.4)	120 (93.8)	0.06
Provided with written information	42 (40.8)	107 (83.6)	<0.0001
Provided with information on equipment when required	24 (64.9)	89 (98.9)	<0.001
<b>Medication information provision</b>			
Given information on purpose of medication	32 (84.2)	50 (90.9)	0.33
Given information on side effects of medication	18 (46.2)	37 (67.3)	0.04
Given information on frequency of medication	23 (59.0)	40 (74.1)	0.12
<b>Follow up arrangements</b>			
Follow up appointment with healthcare professional arranged	49 (47.6)	81 (63.3)	<0.001
<b>Provision of work related certificates</b>			

Medical certificate required but not received	9 (8.7)	0 (0.0)	N/A
Workers compensation certificate required but not received	3 (2.9)	0 (0.0)	N/A

The provision of information, organisation of follow-up appointments and the provision of work related certificates all improved following the intervention. Some of the between group differences did not reach statistical significance because either the groups were too small or the pre-intervention frequency was high.

The CTM score represents an outcome measure for transition from hospital to home. It is calculated out of 100 where a higher score indicates a better transition post discharge from hospital (Coleman et al 2005). The Cronbach's alpha for the CTM result in this study sample was 0.95. Results of Mann-Whitney U tests comparing average CTM scores showed that the pre-intervention group (n=103) had a median care transitions measure score of 64.2.(IQR =11.36) while the post-intervention group (n=128) had a higher median score of 83.3 (IQR =27.2) and the differences between the two groups reached statistical significance (p<0.001).

The participants were asked to keep a diary of any difficulties they experienced once home and of visits to health professionals related to the reason for emergency department presentation. The post-intervention group was more likely to have follow up appointments made before they left the emergency department compared to the pre-intervention group (63.3% v 47.6%; p<0.001). While a smaller proportion of the post-intervention group, compared to the pre-intervention group, required an unscheduled visit to a health care provider following discharge, this difference did not reach statistical significance (17.5% v 12.6%; p=0.31).

## DISCUSSION

The provision of written discharge information (12.6 %) and discharge letters (40.8%) were poor pre-intervention. This contrasts with other studies such as Arendts (2006) where the majority of patients felt that they received adequate discharge information and 80% of patients received written instructions. This may reflect a system failure in this department or poor education of the medical team in discharge planning practices. However, the improvement in all outcomes, including the CTM score, post-intervention indicates that an EDDI nurse can improve post-hospital care transition.

Patients attach great importance to information on illness and treatment (Suhonen et al 2005). In this study the provision of information specific to the diagnosis was significantly improved in the post-intervention group. This was also found by Byrne et al (2000) where patients seen by a nurse practitioner were significantly more likely to receive discharge information and written instructions (McKenna et al 2000). Studies of information provision in Australasian EDs have suggested that preformatted instructions should be provided to all patients (Taylor and Cameron 2000a). The results of this study suggest that patients seen by an EDDI nurse are more likely to receive such information.

Few patients in the study required medical or workers compensation certificates so the numbers were too small for between group comparison. All of the patients seen by the EDDI nurse, who required certification, received it. The provision of such certificates after the point of discharge provides frustration for patients attempting to gain compensation and for emergency administration staff trying to retrieve medical records from storage.

The provision of information on medication purpose and frequency showed no significant difference between the two groups. However patients seen by the EDDI nurse were more likely to be given information on the side effects of medications. In a study of doctor-patient communication Crane (1997) found that 74.6% of discharged emergency patients understood the function of their medication but only 25.8% understood the schedule or frequency. The favourable results of this study may reflect that only a limited range of medications, often simple analgesics, are prescribed from the unit.

Patients who had contact with the EDDI nurse were more likely to have appointments made for follow up care. These results concur with studies of inpatient discharge planning where patients seen by a nurse co-ordinating the discharge process were more likely to have follow-up appointments made (Einstadter et al 1996).

The percentage of patients requiring an unscheduled visit to another health care practitioner was 17.5% in the pre-intervention group and 12.6% with the EDDI nurse. Although this was not a statistically significant difference, the study only recognised a one week period for unscheduled returns. A longer period of observation may have detected more patients representing unnecessarily. Interventions in elderly patients discharged from EDs have shown a reduction in representation from 22.2% to 16.5% (Suhonen et al 2005). Similarly a multidisciplinary care coordination team in Melbourne found only 2.1% of elderly patients assessed by them had an unplanned representation (Moss et al 2002). Little data exists though as to what is an acceptable rate of representation to a minor injuries unit.

Few validated tools exist to assess the quality of care transitions from the patient's perspective (Coleman et al 2005). The Care Transitions Measure has been shown to have a high internal consistency and to discriminate between patients who did and did not have a subsequent rehospitalisation for their index condition (Coleman et al 2005). The measure was formulated using a small sample of inpatient focus groups in a northwest American centre with patients that had complex medical problems. As such it is not specifically designed to be applied to ED patients with minor injuries. Despite this it could clearly discriminate between these two groups of ED patients who received very different levels of discharge preparation.

Other limitations of the study include the number and types of patients lost to follow up and patients excluded from the study. Two to three attempts were made to contact patients by phone for follow-up. The patients in the non-responding group were not found to have a significantly different demographic profile nor range of diagnostic group. However the loss of these patients introduces bias as this group may have been less able to manage their health care problem or been unsatisfied with the service provided. A small number of non-English speakers were included in the study group but all were lost to follow up. These patients have been shown to have poorer comprehension of discharge instructions (Clarke et al 2005) and pose a challenge for future successful discharge processes. Their loss means that the results cannot be generalised to include this group.

The benefits of discharge planning have been acknowledged in the literature particularly in the setting of transition from inpatient care to the community (Einstadter et al 1996; Laing and Behrend 1998), as well as with at risk, elderly patients in the ED (Naylor et al 1995; Moss et al 2002; Caplan et al 2004). Many of the problems with providing adequate discharge planning relate to a lack of co-ordination and communication between professionals and poor provision of information to patients

and their carers (McKenna et al 2000). The results of this study suggest that the effectiveness of discharge planning can be transferred to the ED for patients discharged from a minor injuries unit.

## CONCLUSIONS

The results of this study indicate the use of an EDDI nurse leads to an improvement in the provision of written discharge letters and information, the provision of information specific to the diagnosis, the provision of information on side effects of discharge medications, the arrangement of follow up with other health care providers and overall in post-hospital care transition. This study provides beginning evidence for the utility of an EDDI nurse whose role would be patient education and co-ordination of a multidisciplinary discharge team. Future research may incorporate randomised controlled trial design as well as testing alternative interventions such as a discharge education program for medical staff.

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