

Emergency department triage nurse initiated pain management

以急症室分流護士初步施行止痛治療

HK Goh 吳欣凱, SE Choo 朱瑞英, I Lee 李愛琳, KY Tham 譚金瑩

Objectives: 1) To determine the time difference to analgesia administration for patients with painful limb conditions using an emergency triage nurse initiated pain management protocol versus analgesia administration by emergency doctors after consultation. 2) To determine the frequency of adverse events following such a protocol implementation. **Methods:** For emergency department patients with isolated limb injury or inflammation, a triage nurse initiated pain management policy was implemented in 2004. The protocol did not require the triage nurse to consult a physician. The triage nurse would record the chief complaint, past medical history, allergy, medication, vital signs, and pain severity using a combination of 0 to 10 numerical and face pain scales. Unless contraindicated, the triage nurse would offer intramuscular ketorolac to patients with pain score ≥ 5 . Medical charts of patients fulfilling the inclusion criteria were reviewed from 1 to 30 September 2004. **Results:** Two hundred seventy-three patients were reviewed, of whom 73.3% were men and the overall mean age was 40.1 years (standard deviation SD 19.5). Two hundred and nine patients (76.6%) had pain score recorded at triage, and the median was 6. One hundred and five patients (38.5%) received analgesia, of which 69 were given by triage nurses and 36 by physicians. The mean time interval for analgesia given by triage nurse was 2.5 minutes (SD 8.9) and that for physician was significantly longer ($p < 0.0001$) at 68.2 minutes (SD 59.5). There was no adverse drug reaction observed in patients who received intramuscular ketorolac given by triage nurses. **Conclusion:** The time interval for pain relief of emergency department patients with painful limb conditions was reduced when the triage nurse initiated pain management. (*Hong Kong j.emerg.med.* 2007;14:16-21)

目的：1) 確定在有肢體痛楚情況的病者，以急症分流護士初步施行止痛治療的方案，比較急症醫生診症後施行止痛，在時間上的分別。2) 確定實施這治療方案後不良事故的頻率。**方法：**本急症室在2004年對單一肢體受傷或發炎的病者實施以分流護士初步施行止痛治療的政策。在方案下，分流護士不需要諮詢醫生。分流護士會記錄主訴、過往病歷、過敏症、服用藥物、生命表徵及痛楚嚴重程度（聯合使用0-10數目及面容痛楚標尺）。除非有禁忌症，分流護士會對痛楚分數5或以上的病者提供酮咯酸肌肉注射。我們審閱2004年9月1日至30日滿足包含準則病者的醫療圖表。**結果：**審閱了273名病者，73.3%為男性，總體的平均年齡為40.1歲（標準偏差19.5）。209名病者（76.6%）的痛楚分

Correspondence to:

Goh Hsin Kai, MBBS, MRCS, MRCP

Tan Tock Seng Hospital, Department of Emergency Medicine,
11 Jalan Tan Tock Seng, Singapore 308433, Republic of Singapore

Email: hsin_kai_goh@ttsh.com.sg

Choo Swee Eng, RN

Irene Lee, RN

Tham Kum Ying, FRCS, FAMS

數在分流時被記錄，而中位數為 6。105 名病者 (38.5%) 接受止痛藥，69 名由分流護士給與，36 名由醫生給與。分流護士給與止痛的平均時間為 2.5 分鐘 (標準偏差 8.9) 而醫生給與止痛的平均時間為 68.2 分鐘 (標準偏差 59.5)，顯著地較長 ($p < 0.0001$)。接受分流護士肌肉注射酮咯酸的病者，沒有不良藥物反應被觀察到。**總結：**以分流護士初步施行止痛治療時，急症室有肢體痛楚情況病者的止痛時間較短。

Keywords: Analgesia, emergency nursing, nursing assessment, pain, triage

關鍵詞：止痛、急症護理、護理評估、痛楚、分流

Introduction

Pain is one of the most common reasons for seeking help in the emergency department (ED).¹⁻³ Worldwide, patients with pain including those suffering from painful musculoskeletal conditions often received inadequate pain relief¹⁻⁴ or delayed care due to frequent ED overcrowding.^{2,5} Literature review has shown that objective pain assessment and early pain relief are becoming the standard practice in EDs in countries such as Australia, United Kingdom (UK) and the United States of America (USA). It is good clinical and professional practice to relieve patients' pain as soon as possible. It is therefore reasonable that pain management should be initiated at the time of the patient's first contact with a health care worker in the ED, which is the triage. Allowing triage nurses to give analgesia would reduce the waiting time for pain relief. Many reports have shown that nurses can follow a protocol and initiate effective analgesia, resulting in more timely relief of acute pain.⁵⁻¹⁰

Our hospital has one of the busiest ED in the nation and this translates to long waiting hours for consultation. In order to prevent prolonged delay in administering pain relief to patients, an efficient pain management system is needed. The study ED implemented a triage nurse initiated pain protocol in 2004. This protocol allowed the triage nurse to assess pain objectively and subsequently to initiate pain relief autonomously to patients with painful limb conditions.

Objectives

The objectives of this study were:

1. To determine the time difference to analgesia administration for patients with painful limb conditions using an emergency triage nurse initiated pain management protocol versus analgesia administration by emergency doctors after consultation.
2. To determine the frequency of adverse events following such a protocol implementation.

Methodology

Our hospital is a 1,000 bed hospital with an ED seeing an average of 350 patients a day. In Singapore, nurses are not allowed to prescribe any non-OTC (over-the-counter) medication without prior authorisation from a physician. The physicians and nurses of the study ED drafted a protocol to empower triage nurses to prescribe and administer analgesia without the need for physician's authorisation. Our medical board then gave approval for the ED to implement administration of analgesia by state registered triage nurse performing the triage duty.

With approval from the medical board, ED physicians and nurses were educated about the protocol and the use of pain scale to assess patient's pain. For nurses, these topics were emphasised as: -

1. Basic pharmacology of nonsteroidal anti-inflammatory drugs (NSAID)
2. The "5 Rights": right patient, right drug, right dose, right time, right route; and also a 6th right was introduced – right to refuse
3. Indications and contraindications

The triage nurse's task was to take the history for chief complaint, past medical history, allergy, current medication use, and contraindications to NSAID. He/she would then assess the severity of pain using a combination numerical scale of 0 to 10 and faces-graphic scale. Intramuscular ketorolac would be offered if the patient had isolated limb injury or inflammatory condition and a pain score ≥ 5 . The nurse were reminded to consult an emergency physician if he/she had doubts when administering analgesia to the patient.

Medical charts of consecutive cases of patients who fulfilled the inclusion criteria and were offered analgesia in accordance to the pain management protocol were reviewed from 1 September 2004 to 30 September 2004. The inclusion criteria of the study were: -

1. Patients 16 years and above;
2. Patients presenting with isolated limb conditions, e.g. contusion, fractures, acute flare of gout; and
3. Patients who were haemodynamically stable i.e. (systolic blood pressure >100 mmHg, pulse rate <100 /min and respiratory rate <20 /min).

The exclusion criteria were: -

1. Patients with multiple injuries;
2. Patients with a past history of renal impairment, peptic ulcer and asthma; and
3. Patients with known allergy to NSAID.

Demographical data such as gender, age, race and nationality were recorded. Other data such as the time of registration, time of analgesic administration, patient's pain score, principal diagnosis and disposition status of the patient were also collected.

The collected data were managed and analysed by SPSS version 13 for Windows. The data set was analysed using a two-tailed t-test for all continuous variables with the confidence interval set at 95%. A p-value of less than 0.05 was considered significant.

Results

Two hundred and seventy-three patients met the inclusion criteria. Among the 273 patients, 200 were men (73.3%). The patients' age ranged from 16 years to 93 years. The mean age was 40.1 years (standard deviation was 19.5), and the median age was 36 years.

Two hundred and nine patients (76.6%) had their pain score recorded at triage. The median pain score for these patients was 6. Among them, 150 (54.9%) had pain score ≥ 5 . Of the 150 patients, 69 (46.0%) accepted analgesic offered by triage nurse; while 81 (54.0%) refused pain relief at triage. The reasons for refusal by the patients were not recorded. Subsequently, 36 of the 81 patients (44.4%) received analgesic after consultation with emergency doctors. Totally 105 received analgesia (Figure 1).

The mean time to pain relief from registration and from triage for the group of patients who received nurse initiated pain relief was 18.8 and 2.5 minutes respectively. For patients who received pain relief after consultation with doctors, the mean time of pain relief from registration and from triage was 84.3 and 68.2 minutes respectively (Table 1).

Seventy-one patients had minor injuries including contusion and abrasions while 155 had fractures. Another 47 patient had inflammatory conditions involving their limbs. The majority of these conditions included gouty arthritis and cellulitis (Table 2).

No adverse drug reaction was reported by patients or observed by healthcare workers (HCW) upon patients' discharge. There was also no medication error.

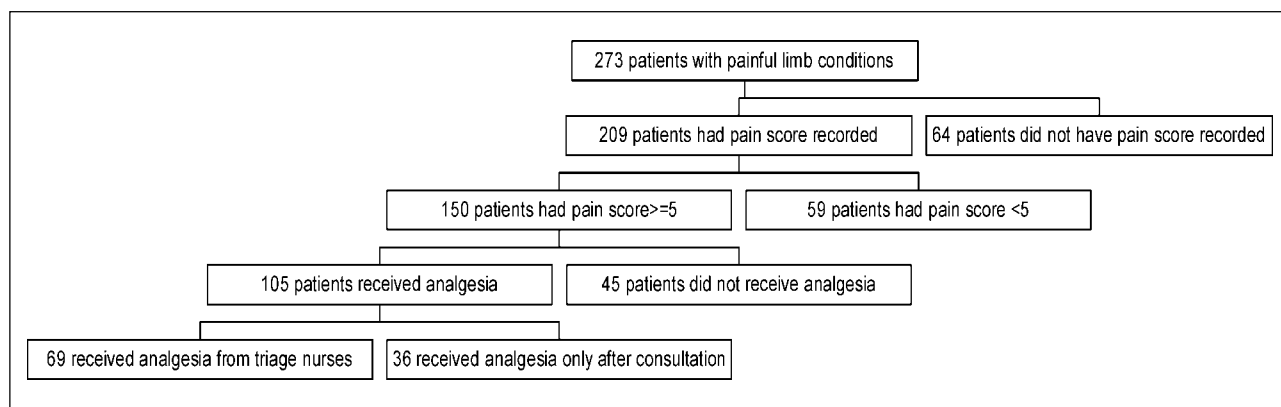


Figure 1. The flow of subjects.

Table 1. Comparison of time to analgesia by triage nurse versus analgesia given during medical consultation

Time from	Analgesia by triage nurse (n=69)	Analgesia by doctor (n=36)	P
Registration to analgesia (SD), min	18.8 (SD 17.8)	84.3 (SD 61.0)	<0.0001
Triage to analgesia (SD), min	<u>2.5</u> (SD 8.9)	68.2 (SD 59.5)	<0.0001

Table 2. The different diagnoses of the patients

Diagnosis	Number
Minor injury e.g. contusion	71 (26.0%)
Upper limb fracture	98 (35.9%)
Lower limb fracture	57 (20.9%)
Inflammatory condition e.g. gout, cellulitis	47 (17.2%)

Discussion

Relieving pain expediently is humane and good clinical practice and especially important in a busy ED with frequent overcrowding. This project and several others show that registered nurses can initiate pain assessment and administer analgesia safely.

In an earlier study done by our ED, 66.9% of patients with traumatic pain expected analgesia to be given within 15 minutes of their arrival in the ED. This expectation was not met in 91.1% of the time.² This is not an isolated problem in our ED. In fact, others had shown similar untimely management of acute pain in the ED.^{11,12} This problem has led some EDs to review their processes by establishing pain management protocols. Different protocols use different analgesics and different routes of administration. This study

served to address the concerns and problems that may arise when implementing such a protocol.

The primary concern for a pain protocol is its safety concerning the medical well being of the patients. The first risk is in the inherent nature of the analgesic drug used. Some studies involved opioid in their protocols.⁵⁻⁹ These studies highlighted the possibility of respiratory depression and cardiovascular instability when opioid was used. However, these studies consistently showed that adverse effects, even with opioid, were uncommon. Our study avoided this problem as ketorolac, an NSAID, was used as the analgesic. However, NSAIDs do have their own adverse effects including bronchospasm, gastrointestinal bleeding and allergic reaction. Safety mechanisms have to be built into the protocol including taking a detailed history concerning drug allergy status, previous history of asthma and

peptic ulcer disease. Any adverse effect would have to be recorded and reported. It is encouraging to note that no adverse effect was reported during the period of review.

The triage nurse initiated pain management protocol needed a paradigm shift in several groups of staff in the hospital. The protocol required the nursing staff to play a central role. It is logical for nursing staff to take on this role as they are the first HCW that an ED patient will come into contact. As in the experience of others,^{6,10} there were concerns expressed by hospital medical teams about the safety of this approach during the developmental stage of the protocol. During internal feedback sessions, ED nursing staff themselves also expressed concern about this new responsibility. Nursing staff in the study ED had previously been involved in other protocols and had consistently shown that they were able to follow and perform effectively. This fact, supported by literature review of successful implementation of pain management protocol in other EDs, convinced the nursing and medical staff. The nurses involved in the protocol had to go through rigorous education sessions. Choosing only the more experienced nurses to be involved in the initial stage acts as a further safeguard. Another problem is related to the multi-racial and multi-lingual population background of our ED patients and our ED HCW. Pain perception and severity is a culturally based concept and is highly subjective. While some researchers debated the objectification of the highly subjective concept of pain, the study ED decided that use of a face pain scale would minimise the difficulties due to our multi-racial and multi-lingual population background.

The project yielded favourable results because there was proactive education and re-education of staff members regarding the assessment and documentation of pain severity and the administration of analgesia. Another step done was analysing and sharing results with the team. This served to improve performance. Subsequent feedback among the nurses showed satisfaction with this new autonomy. We proposed that similar protocols could be used for other conditions and other EDs.

Limitations

There was the problem of documentation inadequacies in the study. Indeed, pain assessment and documentation was less than 80% and this could be improved. This has been highlighted to the nursing staff and subsequent audits have shown improvement. Documentation of the reason for withholding analgesia by the triage nurse was also incomplete. We noted that though time from triage to analgesia was significantly improved, effort could still be made to review this work process and to improve time from registration to analgesia. Finally, the patients were not followed up after discharge to assess for late adverse drug effects.

Conclusions

A triage nurse initiated pain management protocol supported by the ED and hospital nursing staff can reduce the time to analgesia for patients with painful limb conditions. Careful assessment can reduce the risk of adverse drug reaction when nurses administer NSAID analgesia.

References

1. Todd KH. Pain management in the emergency department. Chicago: American College of Emergency Physicians; 2004.
2. Lim GH, Wee FC, Seow E. Pain management in the emergency department. *Hong Kong J Emerg Med* 2006; 13(1):38-45.
3. Tanabe P, Buschmann M. A prospective study of ED pain management practices and the patient's perspective. *J Emerg Nurs* 1999;25(3):171-7.
4. Rupp T, Delaney KA. Inadequate analgesia in emergency medicine. *Ann Emerg Med* 2004;43(4):494-503.
5. Campbell P, Dennie M, Dougherty K, Iwaskiw O, Rollo K. Implementation of an ED protocol for pain management at triage at a busy Level I trauma center. *J Emerg Nurs* 2004;30(5):431-8.
6. Seguin D. A nurse-initiated pain management advanced triage protocol for ED patients with an extremity injury at a level I trauma center. *J Emerg Nurs* 2004;30(4): 330-5.
7. Boyd RJ, Stuart P. The efficacy of structured assessment and analgesia provision in the paediatric emergency department. *Emerg Med J* 2005;22(1):30-2.

8. Fry M, Holdgate A. Nurse-initiated intravenous morphine in the emergency department: efficacy, rate of adverse events and impact on time to analgesia. *Emerg Med (Fremantle)* 2002;14(3):249-54.
9. Kelly AM, Brumby C, Barnes C. Nurse-initiated, titrated intravenous opioid analgesia reduces time to analgesia for selected painful conditions. *CJEM* 2005; 7(3):149-54.
10. Coman M, Kelly AM. Safety of a nurse-managed, titrated analgesia protocol for the management of severe pain in the emergency department. *Emerg Med* 1999; 11:128-32.
11. Ducharme J, Barber C. A prospective blinded study on emergency pain assessment and therapy. *J Emerg Med* 1995;13(4):571-5.
12. Tanabe P, Thomas R, Paice J, Spiller M, Marcantonio R. The effect of standard care, ibuprofen, and music on pain relief and patient satisfaction in adults with musculoskeletal trauma. *J Emerg Nurs* 2001;27(2):124-31.