

# Do triage nurse-initiated X-rays for limb injuries reduce patient transit time?

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**Patients with isolated limb injuries are often required to wait a long time for treatment and investigation in emergency departments. It was hypothesized that allowing triage nurses to initiate X-rays would reduce transit times for these patients. A prospective, randomized comparison trial of 175 patients was conducted, comparing transit times between a group of patients who had X-rays initiated at triage and a group which did not. No statistically significant reduction in transit time was demonstrated by this change in practice, either for a group who had sustained fractures or for one which had not. Despite this finding, staff and patient satisfaction with this change in procedure was high. This justifies continuation of the practice and further research.**

## INTRODUCTION

Emergency departments (EDs) are very busy places and unfortunately for some groups of patients long waiting times are the rule, rather than the exception. One such group is those patients who have suffered isolated limb injuries.

The traditional model for processing patients with isolated limb injuries in the ED is for them to be triaged into a priority category by a triage nurse and then be assessed by a doctor who decides whether an X-ray is needed. If this is the case, as occurs in 90% of cases

(Davies 1994), the patient waits for the X-ray and then waits again for a second consultation with the doctor to discuss the results and recommended treatment. Thus, these patients have two consultations with the doctor and three waiting times (one to see the doctor, another for X-ray and a third for the second consultation). Allowing triage nurses to request X-rays at the time of initial attendance could potentially decrease delays for patients, and lead to more efficient use of staff time.

A pilot study in the Emergency Department of the Western Hospital Footscray, Melbourne suggests that the average time-savings for the patient could be in the order of 45 minutes (Kelly et al 1995).

This practice of nurse-initiated X-rays occurs at some centres in the United Kingdom with the support of the Casualty Surgeons Association, the Royal College of Radiologists and the College of Radiographers. Published results to date suggest time-savings for patients of between 8 and 60 minutes (Davies 1994, McLeod & Freeland 1992).

The aim of this study was to establish whether there is any time-saving for patients from triage nurse-initiated X-ray.

## METHODS

This randomized, prospective comparison trial was conducted in the Emergency Department of Western Hospital Footscray, a 350-bed teaching hospital in Melbourne, Australia with approximately 35 000 emergency attendances annually.

Patients aged 14 years or more presenting with isolated acute injuries to the wrist or ankle were randomized, by date of presentation, to have X-rays initiated at the discretion of the triage nurse prior to being seen by the doctor, or to be assessed by the doctor prior to the decision to X-ray. On odd dates, triage nurses could initiate X-rays from triage in those cases that met the inclusion and exclusion criteria, and in which the nurse judged an X-ray to be a necessary investigation. On even dates, patients were triaged and then assessed by the medical officer, who made the decision to X-ray or not.

Patients who did not have X-rays performed during the ED visit were excluded from the study. Also excluded were patients with severe pain in need of urgent analgesia, as the investigators considered it unethical to delay analgesia for the performance of an X-ray. Patients admitted to inpatient wards for management were also excluded, because transit time for this group is not in the control of the ED, and may be affected by availability of beds or delays waiting for specialty registrar assessment. It was considered that this would bias the results.

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All nurses performing the role of triage nurse are experienced nurses and have undergone a training programme in the skills of triage.

Data collected were: the time of arrival at ED; time of X-ray; time of first consultation with doctor; time of discharge; and results of X-ray. For analysis, patients were divided into four groups based on whether they had a triage-initiated X-ray and whether a fracture was present. This latter criteria was used because management of fractures requires more time both for consultation and for management. The primary endpoint of the study was transit time (total time in the ED from presentation to discharge).

Data were analysed using the Kruskal-Wallis analysis of variance test.

This study had the approval of the Research and Ethics Committee of the Western Hospital Footscray.

## RESULTS

One hundred and seventy-five patients were enrolled in the study between 16 January and 31 July 1995. There were 55 fractures and 121 soft tissues injuries. Transit time results are summarized in Tables 1 and 2.

In neither the fracture nor the no fracture group was there a statistically significant difference in transit time between those who had undergone triage-initiated X-ray and those who had not ( $P = 0.37$  and  $0.14$  respectively).

There was also no difference in transit time between the ankle injury and wrist injury groups. Of those patients who had an X-ray ordered by the triage nurse, 77% had their X-ray before being seen by the doctor.

**Table 1 Transit time (minutes) according to whether a triage-initiated X-ray was performed for patients who had not sustained a fracture ( $n = 121$ )**

Time (Minutes)	Nurse-Initiated X-ray	
	Yes	No
Mean	100	114
Median	84	100
Inner-quartile range	65, 131	74, 142

**Table 2 Transit time (minutes) according to whether a triage-initiated X-ray was performed for patients who had sustained a fracture ( $n = 55$ )**

Time (Minutes)	Nurse-Initiated X-ray	
	Yes	No
Mean	173	179
Median	135	169
Inner-quartile range	82, 236	138, 207

## DISCUSSION

Limb injuries are a common reason for presentation at EDs. Unfortunately, due to the relatively minor nature of those injuries in comparison with other conditions, these patients often have long waits for assessment and treatment.

In the current process, patients are triaged by a nurse, assessed by a doctor who decides whether to perform an X-ray, and are then seen again by the doctor after the X-ray has been taken. It was hypothesized that by changing the process such that an experienced nurse had the option of ordering an X-ray before the patient was seen by the doctor, transit times for patients would be reduced and departmental efficiency enhanced. That there was no significant difference in transit time, particularly in the no fracture group, was a surprise. Factors that may have contributed to this are the relatively short transit times identified in the study and the variations in workload of the X-ray department and treatment area. These variations are highlighted by the fact that only 77% of patients for whom an X-ray was ordered from triage had that X-ray before seeing the doctor.

Reductions in transit time are, however, not the only measure of outcome for this change in practice. Other important considerations are patient satisfaction and triage nurse and doctor acceptance of the practice. Triage nurses were happy with the change in process. They felt comfortable deciding the need for X-ray and believed the system to flow better. They also report that, although patients did not know that there was a change in practice, they seemed satisfied that something was happening for them. No formal patient satisfaction data were collected. Medical staff accepted the change well and reported that they believed being able to perform a complete assessment of a limb injury, including checking an X-ray, in one consultation was more efficient.

## CONCLUSION

Although, in this study, triage-initiated X-rays did not result in a significant reduction in ED transit time for patients, the practice was welcomed by patients, nursing and medical staff. The high level of satisfaction with this change in practice justifies its continuation and further research.

## REFERENCES

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