

Team triage improves emergency department efficiency

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Objective: To see whether three hours of combined doctor and nurse triage would lead to earlier medical assessment and treatment and whether this benefit would carry on for the rest of the day when normal triage had resumed.

Method: Eight days were randomly selected; four for team triage and four for the normal nurse led triage. Team triage was coordinated by a middle grade or consultant from 9 am to 12 noon. Times to triage, to see a doctor, radiology, admission, and discharge were recorded. No additional medical or nursing staff were used and staffing levels were similar each day. All patients including blue light emergencies and minor injuries were included.

Results: Median times were significantly reduced ($p < 0.05$) during the intervention to triage (2 min v 7 min, $p = 0.029$), to see a doctor (2 min v 32 min, $p = 0.029$), and to radiology (11.5 min v 44.5 min, $p = 0.029$). Waiting times at midday were longer for patients in the non-intervention group. More patients were seen and discharged within 20 minutes in the intervention group (18 of 95 (19%) v 2 of 69 (3%) $p = 0.0043$). No significant knock on effect was demonstrable for the remaining 21 hours after the intervention ceased.

Conclusion: Three hours of combined doctor and nurse triage significantly reduces the time to medical assessment, radiology, and to discharge during the intervention period. Waiting times at midday were shorter in the triage group. There was no significant knock on effect the rest of the day.

Waiting times in the emergency department are a source of dissatisfaction among patients.¹ Because of these pressures triage by nursing staff has been formalised. A consequence of this is those most amenable to quick treatment often wait the longest. Efforts to triage patients with minor conditions may take as long as the time spent treating the patient.

Quite often the medical assessment is a duplication of the triage assessment. Referral of the patient back to the waiting room after triage increases staff workload, as the patient must be re-routed back into the examination area again. This can involve over 20 stages in our department.

While nurse practitioners can treat some of these patients, other complaints, both minor and major require medical evaluation. Combining doctor and nurse assessment and starting treatment immediately should provide greater efficiency.

We postulated that a doctor and nurse team performing triage (team triage) for a limited period could significantly reduce times to triage, medical evaluation, analgesia, investigation, and disposal. This might have a follow on effect for the rest of the day with reduced departmental congestion after a period of team triage in the morning had stopped.

METHOD

Eight days, either Tuesdays or Thursdays over four consecutive weeks were selected when staffing levels were predicted to be adequate and similar and could be fixed for the purpose of the study so that identical levels of medical staff, both in number and seniority, would be present on intervention and normal days. The medical team consisted of four doctors. This is slightly below our normal medical staffing. Other doctors were available in the department (one to two consultants, and one middle grade) at the time but were diverted to non-clinical activity so as not to bias the study. An equal number of Tuesdays and Thursdays were allocated to each group.

Nursing numbers could not be fixed as agency nurses were frequently appointed at short notice to cover trolley waits. However, there were no apparent or unusual excess or shortage of nurses on trial days. Days were randomised for team triage or the normal nurse led triage. The emergency department is in a large urban teaching hospital seeing 50 000 new attendees per annum. Fifty one per cent of all patients are categories one, two, or three and inappropriate attendees are less than 10%. All GP referrals for admission and most other emergency admissions come through the department. The department has direct admitting rights to medical and surgical wards. The department does not see children less than 13 years of age.

Team triage was performed between 9 am and 12 noon by a designated consultant, a middle grade, SHO, or a triage nurse and another SHO joined them at 11 am. SHOs were encouraged to participate in triage under supervision. Patients were seen by whichever team member was free. Nurses were encouraged to extend their role with medical cover and make decisions about radiology, treatment, and discharge. No nurse practitioners took part.

The triage team saw all new patients as they arrived, starting treatment, investigation, or directed them to another member of staff if a lengthy procedure, for example, suturing was required.

Collected data included time of registration, triage or team assessment, time to analgesia, radiology, and time to discharge/admission.

Before starting the trial it was decided that if team triage was overwhelmed, for example, major trauma and patients were not being seen within 15 minutes of registration (in keeping with national triage guidelines) on the intervention days, then nurse triage would be reinstated for the rest of the day. This would then be defined as demand outstripping resources and recorded.

On standard nurse led triage days, the normal system in our department applied, where all new attendees were assessed by a trained, dedicated triage nurse and assigned a

triage category. The medical staffing was the same as the intervention days.

Data were analysed using SPSS software and by a Mann-Whitney U test for non-parametric data.

RESULTS

There were 1028 new attendees to the department on the eight study days, 530(51.6%) on the intervention days, 498(48.4%) on the non-intervention days. There was no significant difference in the number of attendees on each of the study days.

Times were reduced significantly during the period of the intervention for triage times, time to see a doctor, and time to radiology (see table 1).

More patients were treated and discharged within 20 minutes in the intervention group (18 of 95 (19%) compared with 2 of 69 (3%), $p = 0.0043$).

The average waiting times at midday were 5.5 minutes in the team triage group, compared with 51.7 minutes on a normal day on team triage.

There was no demonstrable follow on effect for the remainder of the day (table 2). No significant difference could be shown for times to be seen on the team triage days compared with the normal days for the following 21 hours, however the total patient hours spent in the department was reduced on the intervention days after 12 noon, 575 hours compared with 677 hours.

DISCUSSION

Consultant led triage has been shown to reduce waiting times² as has small team consultation systems.³ However, this is the only study we are aware of that firstly includes all emergencies, and secondly combines medical and nursing triage/assessment format. Team triage reduced the time to see a doctor, radiology, and it also reduced length of stay in the department for its duration. All patients were seen within 15 minutes. This effect did not continue after team triage stopped, although comparison of eight medians may not have been sufficient to show significance. The effect may have carried on for some hours after stopping team triage, as waiting times were less at midday in the team triage group and the total patient hours in the department was reduced on the team triage days for the 21 hour period after team triage stopped.

Time to analgesia was not significantly improved. This may have been attributable to failure to give analgesia as planned at presentation. Time to nurse discharge was similarly not significant. This is not recorded routinely and small numbers may have contributed to this.

The process did not entail any increase in resources, medical staffing was slightly below average. The triage nurse was freed up to participate in patient assessment and treatment. This would be ideal for nurses with an extended role.

The doctors found that seeing patients walk in or move from a stretcher onto a bed gave them additional clinical information they might otherwise have not obtained.

On both standard and team triage¹ days the level of medical staffing was fixed for the purposes of the study, which removed flexibility from the system. Although additional medical staff were present in the department at the time no doctor was diverted from non-clinical duties.² Medical staff were pressurised at times when case mix was heavy. However, all patients were seen within 15 minutes, although doctors did miss their breaks at times. There were also times where staff were underused and this was often used as a teaching opportunity for nursing and junior medical staff.

Nursing staff were not under pressure as a result of the study because there was effectively one extra nurse (as they were not on full time triage duties) and a number of patients, for example, minor injuries, were seen and discharged without any nursing intervention. Some nurses did find the system difficult to adjust to as not all patients were seen by nurses and patient tracking methods changed. These issues are under discussion and under further trial. No patient of any category waited longer than 15 minutes to be assessed by a doctor and ambulance borne patients were usually seen before self referrals as department design favoured this. Triage was carried out on self referrals near the ambulance entrance so that all patients were assessed initially at one end of the department, reducing the amount of movement for the triage team.

When nurses were busy because of other pressures, for example trolley waits, team triage kept new patients moving albeit limited by space. Team triage reduces demands for space as more patients are "treated and stretched" or sent directly to radiology and never wait in a cubicle.

Department congestion was never critical enough to cause gridlock during the trial. This might have slowed down team triage, had we run out of examination space. (In practice this happens about once per month in our department.) Team triage would then have halted prematurely, on that day although it may have been beneficial while running. This system could run most days when staffing levels are adequate. Team triage cannot start when there are patients' waiting in the department as it is unfair to treat the new arrivals instantly while others have been waiting. In our department the only opportunity to begin this is between 8 am and 9 am, however it could also run flexibly, and on quiet days could run all day, and on busy days stop at 10 30 am and revert to normal triage when the waiting time exceeded 15 minutes.

Evidence suggests that experienced doctors have the confidence to treat and discharge patients without resort to lengthy investigation.⁴ In addition we felt that an experienced team seeing all minor injuries and blue light emergencies was more likely to detect serious illness early on.

Table 1 Median times (min) intervention compared with control for the period 0900–1200

	Intervention	Control	p Value
Time to triage	2.00	7.00	0.029
Time to see doctor	2.00	32.00	0.029
Time sent to radiology	11.5	44.0	0.029
Time to analgesia	13.00	37.5	0.400
Time to discharge	37.00	82	0.057
Time to nurse discharge	27.00	22	

Table 2 Median times (min) intervention compared with control for the period 1200–0900

	Intervention	Control	p Value
Time to triage	6	5	0.829
Time to see doctor	44.5	46	0.486
Time sent to radiology	49	53	0.686
Time to analgesia	27	32.5	0.686
Time to discharge	82	95	0.286
Time to nurse discharge	108	96	

Patient streaming has been recommended by the Department of Health⁵ and it has been shown to be effective in reducing waiting times for minor injuries.⁶ Unlike patient streaming there was no queue for treatment. Streaming creates the potential for one stream to be pressurised with treatment delays while another is quiet. This can lead to a mismatch of personnel and patients. Team triage should avoid this problem.

However, with our current staffing this system could not run for 24 hours. There is some flexibility in the system as a rush of patients arriving can be dealt with while other patients, for example returning from radiology, can wait while the new arrivals are assessed.

Team triage cannot continue if sick patients are waiting at the expense of minor injuries, this would also imply that times to assessment were more than 15 minutes and in this situation nurse led triage would resume although in practice this did not happen.

Team triage requires the input of experienced doctors. Work intensity is variable. When a surge in demand arrives staff must work quickly to keep inside the 15 minute period or, alternatively revert to normal triage if demand is excessive. In practice the first hour of the day was quiet, intensity increasing as ambulances arrived later in the day. We could not have run team triage for 24 hours because of resource issues. However, with adequate resources the system could run for longer. It has the potential to reduce the build up of waiting times as the day progresses consequently reducing the number of staff needed to treat patients in the evening and at night.

Is it sustainable? While the same number of patients are being seen by the same number of doctors in a given 24 hour period the only difference is that at times work intensity will be very high with surges in demand. The reward for this is the quieter periods. Adequate resourcing can create a sustainable system. While staffing a department adequately

to run this type of triage 365 days per year is impractical, the system could be run flexibly at chosen periods with efficiency benefits.

CONCLUSION

Doctor-nurse triage teams are an effective way of shortening waiting times. Patients are treated and assessed by experienced medical and nursing staff, whatever the urgency of the condition. There was a significant increase in the number of patients seen and discharged within 20 minutes. Waiting times at midday are shorter as a result. We did not experience a significant knock on effect for the remaining 21 hours but reduced the total patient hours spent in the department. Doctor led triage is not currently feasible over a 24 hour period in most emergency departments because of resource restraints.

Further studies on the effectiveness of the system over a 24 hour period are needed to fully assess its usefulness.

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