

Primary care

NHS Direct versus general practice based triage for same day appointments in primary care: cluster randomised controlled trial

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Abstract

Objective To assess the relative effects on consultation workload and costs of off-site triage by NHS Direct for patients requesting same day appointments compared with usual on-site nurse telephone triage in general practice.

Design Cluster randomised controlled trial.

Setting Three primary care sites in York, England.

Participants 4703 patients: 2452 with practice based triage, 2251 with NHS Direct triage. All consecutive patients making requests for same day appointments during study weeks were eligible for the trial.

Main outcome measures Type of consultation after request for same day appointment (telephone, appointment, or visit); time taken for consultation; service use during the month after same day contact; costs of same day, follow up, and emergency care.

Results Patients in the NHS Direct group were less likely to have their call resolved by a nurse and were more likely to have an appointment with a general practitioner. Mean total time per patient in the NHS Direct group was 7.62 minutes longer than in the practice based group. Costs were greater in the NHS Direct group—£2.88 (95% confidence interval £0.88 to £4.87) per patient triaged—as a result of the difference between the groups in proportions of patients at each final point of contact after triage.

Conclusions External management of requests for same day appointments by nurse telephone triage through NHS Direct is possible but comes at a higher cost than practice nurse delivered triage in primary care. If NHS Direct could achieve the same proportions of consultation types as practice based triage, costs would be comparable.

Introduction

Use of nurses to manage requests for same day appointments in primary care over the telephone is a popular system for managing general practitioners' workload.¹ Triage has been shown to be safe in out of hours services² and to reduce general practitioners' same day appointment workload by up to 49% in routine practice.³⁻⁶ Triage is not cheaper than standard appointment systems,⁶ and many general practices may be unable to employ the critical mass of nurses

needed to deliver a comprehensive service. One solution may be for an external agency such as NHS Direct to provide triage services to practices.⁷

NHS Direct is a direct access health advice line. Nurse advisers use computerised decision support systems to advise callers. Having previously shown that telephone triage by practice nurses within general practice reduces same day appointments with general practitioners,⁶ we wanted to investigate the effectiveness and costs of delivering an off-site telephone triage service in order to determine if off-site triage is a feasible option for primary care. Our aim was to determine the relative effects on consultation workload and costs by conducting a randomised controlled trial of NHS Direct delivered telephone triage for patients requesting same day appointments compared with usual practice based triage.

Methods

The study took place in a general practice in York with six surgery sites, a list size of 32 000 patients, 15 general practitioners (12.5 whole time equivalents), four assistants (three whole time equivalents), and a nursing team of one full time nurse team leader and nine practice nurses (4.5 whole time equivalents). The practice population had a slightly poorer standardised mortality ratio, higher unemployment, and more pensionable residents than the regional average. Three of the practice's surgery sites participated in the study, giving a study population of 17 000. The practice operated a nurse telephone triage system as part of its usual care of patients requesting same day appointments.

Assignment

We randomised patients to practice based or NHS Direct triage by using an independently determined two week block randomisation procedure over 26 weeks; 13 weeks for each condition. We collected data on all patients requesting same day appointments between 8.30 am and 5.00 pm, Monday to Friday.



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Protocol

Patients were informed about the trial when calling for a same day appointment, and reception staff sought their consent. Consent from patients randomised to NHS Direct was further confirmed by nurse advisers.

Interventions

Usual care: practice based triage—An experienced and trained practice nurse telephoned the patient and used clinical judgment to triage the patient, supported by several clinical protocols on the patient record system. Computerised algorithms were not used. Nurses could manage patients through telephone support alone or could refer them for a telephone call from a general practitioner, same day appointment with a nurse or general practitioner, home visit, or routine appointment with a nurse or general practitioner. Individual nurses triaged patients across all three sites. Nurses did not prescribe drugs.

NHS Direct triage—NHS Direct nurse advisers had access to the practice's electronic appointment system but did not access the patients' personal or medical histories. Nurse advisers, all trained to triage using NHS Direct computerised decision making algorithms, telephoned the patient and triaged them to one of the same management options as above.

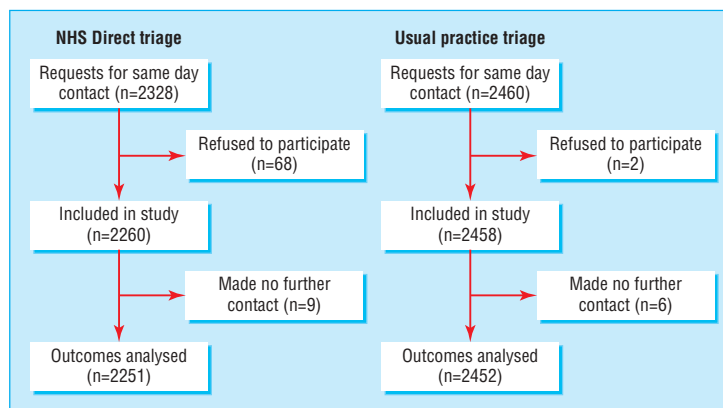
Participant flow and follow up

We collected demographic information from the electronic patient record on patients requesting same day appointments. Nurses and doctors involved in the same day care of each patient recorded in diaries a maximum of three presenting problems from a list of 10 (table 1). NHS Direct nurse advisers completed a standard report containing the same information printed automatically from the decision support software. Consultation time was recorded automatically by the NHS Direct system and with stopwatches by the practice based nurses and doctors. We subtracted one minute from the recorded time of the NHS Direct nurse adviser to account for additional time needed to reconfirm consent.

We calculated costs at the level of the patient, including the direct costs of all staff, drugs, tests, and out of hours and emergency department contacts for one month after the index consultation. We calculated staff costs by using current salary scales multiplied by consultation time. NHS Direct nurse advisers are employed on UK nurse salary grade F and practice nurses on grade G. We calculated follow up costs by using average consultation times. We calculated drug costs from the *British National Formulary* and obtained costs of tests and emergency care from the local service provider.

Analysis

We analysed data on all patients on an intention to treat basis, excluding only patients who could not be contacted by nurses after a call and for whom we had no data. As patients were randomised at the cluster level of the week rather than individually, we aggregated across weeks to create two groups containing 13 weeks each. We determined the effect of the different methods of triage using repeated measures analysis of variance. We used a multilevel Poisson



Flowchart of patients through study

regression to analyse the number of additional consultations.

Results

A total of 4788 patients requested same day appointments during the trial period (fig). The groups were equivalent in terms of age, sex, and number and type of presenting complaints, apart from more patients in the practice group with genitourinary complaints (table 1).

In the NHS Direct weeks the mean number of patients was 173.8 (SD 26.2, minimum 119, maximum 220); in the practice weeks the mean was 189.0 (SD 32.1, minimum 140, maximum 250). Patients in the NHS Direct group were less likely to have their call resolved by a telephone contact or appointment with a nurse and were more likely to have an appointment with a general practitioner (table 2).

Table 1 Demographic information and presenting complaints of patients requesting same day appointments, by NHS Direct or practice triage. Values are numbers (percentages) of patients unless stated otherwise

Characteristic	NHS Direct (n=2260)	Practice (n=2458)
Age (years):		
0-4	386 (17.1)	423 (17.2)
5-16	261 (11.5)	322 (13.1)
17-24	205 (9.1)	225 (9.2)
25-44	599 (26.5)	656 (26.7)
45-64	323 (14.3)	311 (12.7)
65-74	182 (8.1)	186 (7.6)
≥75	304 (13.5)	335 (13.6)
Sex:		
Male	859 (38.0)	899 (36.6)
Female	1401 (62.0)	1559 (63.4)
Presenting complaint*:		
Respiratory system	886 (39.2)	932 (37.9)
Dermatological	300 (13.3)	330 (13.4)
Musculoskeletal	324 (14.3)	307 (12.5)
Digestive system	335 (14.8)	348 (14.2)
Genitourinary system	241 (10.7)	321 (13.1)
Nervous system	145 (6.4)	132 (5.4)
Mental health	99 (4.4)	111 (4.5)
Cardiovascular system	100 (4.4)	97 (3.9)
Eyes	108 (4.8)	103 (4.2)
Other infectious disease	150 (6.6)	155 (6.3)
Other	154 (6.8)	197 (8.0)
Mean No (SD) complaints	1.26 (0.56)	1.23 (0.54)

*Percentages do not add up to 100%, as some patients had more than one presenting complaint.

Table 2 Final point of contact for patients requesting same day appointments triaged by NHS Direct or practice. Values are numbers (percentages) unless stated otherwise

Type of final point of contact	NHS Direct (n=2260)	Practice (n=2458)	Difference in percentage: NHS	
			Direct-practice (95% CI)	P value
Nurse: phone	599 (26.52)	739 (30.07)	-3.55 (-6.83 to -0.31)	0.033
Nurse: appointment	242 (10.71)	341 (13.87)	-3.16 (-5.11 to -1.18)	0.003
General practitioner: phone	72 (3.19)	72 (2.93)	0.26 (-1.04 to 1.55)	0.689
General practitioner: appointment	1083 (47.92)	1033 (42.03)	5.89 (2.28 to 9.46)	0.003
Home visit	255 (11.28)	267 (10.86)	0.42 (-1.89 to 2.73)	0.709
No further contact	9 (0.40)	6 (0.24)	0.16 (-0.29 to 0.63)	0.450

Table 3 Mean (SD) nursing time, general practitioners' time, and total time per patient after triage by NHS Direct or practice

Time	Time (minutes)		Not controlled for final point of contact		Controlled for final point of contact	
	NHS Direct	Practice	Difference: NHS		Difference: NHS	
			Direct-practice (95% CI)	P value	Direct-practice (95% CI)	P value
Nurse	11.16 (1.34)	4.26 (0.45)	6.90 (6.07 to 7.72)	<0.001	7.49 (6.42 to 8.57)	<0.001
General practitioner	6.53 (0.75)	5.81 (0.61)	0.72 (0.27 to 1.17)	0.003	0.19 (-0.25 to 0.62)	0.377
Total	17.69 (1.63)	10.07 (0.55)	7.62 (6.66 to 8.58)	<0.001	7.68 (6.53 to 8.83)	<0.001

Time taken to manage same day requests

We found a significant difference in average nursing time between NHS Direct and practice triage; NHS Direct took 6.9 minutes longer to triage patients (table 3). The average amount of general practitioner's time per patient was greater for NHS Direct patients (0.7 minutes). The total time needed to manage patients' requests was dominated by nursing time, which is reflected in the average total time difference of 7.6 minutes, or 7.7 minutes when we controlled for final destination.

Costs

Same day costs for general practitioners and nurses were greater in the NHS Direct group, leading to an overall mean cost difference of £2.88 (\$5.16; €4.23) (95% confidence interval £0.88 to £4.87) per patient triaged. We found no differences in other practice based costs (general practitioner and nurse follow up time, drugs, and tests), out of hours costs, or emergency department costs. When we controlled for final destination, the difference in nurse costs remained greater for NHS Direct but the total cost (£1.50) was no longer significantly different. Sensitivity analysis did not materially alter the finding that costs were greater in the NHS Direct group unless final destination was controlled for.

Discussion

This study's findings, that telephone triage by NHS Direct took longer and was more costly than the usual practice based triage procedure, are accounted for by two factors. Firstly, NHS Direct nurse advisers managed fewer calls by telephone care by nurses alone, made fewer referrals to appointments with nurses, and referred more patients to general practitioners. Secondly, nurse time was more than 2.5 times greater for the NHS Direct group, leading to a greater overall patient management time. Despite nurses being employed at a lower grade, same day costs of nursing care in the NHS Direct group were about 11% of total costs compared with 6% in the practice group. Costs were more sensitive to the proportions of patients at each final point of contact than to nursing costs.

Several possible explanations for these results exist. Unlike practice nurses, NHS Direct advisers were not able to use previous knowledge of patients to speed decision making. Although practice nurses do have access to patients' records and reported sometimes using these to assist decision making, this is unlikely to be the sole reason for our results. Other explanations include the fact that NHS Direct uses sophisticated but lengthy algorithm based decision support software that nurse advisers must work through fully; that most nurse advisers have never worked in general practice and will be unfamiliar with practice nursing; and that practice nurses delivering triage are the same nurses who subsequently see patients face to face and will have a greater sense of their own competence in consultations.

Limitations

The measurement of time in the usual care group was not as robust as the electronic system used in NHS Direct and may have affected the results. Generalisability of our results is limited by the study being done in a single multisite practice that was experienced in using

What is already known on this topic

Nurse telephone triage is a popular system of managing requests for same day appointments in general practice

Triage is not cheaper than standard appointment systems, and general practices may be unable to deliver a comprehensive service themselves

What this study adds

Triage by NHS Direct does not achieve equivalent outcomes to practice based triage

NHS Direct triage costs more than practice based triage

If NHS Direct could achieve the same patient disposal proportions as practice based triage, costs would be comparable

triage and had an interest in new methods of arranging appointments.

Conclusions

We have shown that external management of requests for same day appointments through NHS Direct is feasible but comes at a higher cost than practice nurse delivered triage. Outcomes for patients on the day of the request were more likely to involve an appointment with a general practitioner in the NHS Direct group. If NHS Direct could achieve the same patient disposal proportions as practice based triage, costs would be comparable. External triage of same day appointment requests is, therefore, possible, although no economies of scale are possible. Nonetheless, the flexibility of an organisation the size of NHS Direct could ensure coverage of all the triage needed. An external triage service might be feasible for smaller practices with fewer resources to organise their own systems.

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Competing interests: None declared.

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A memorable patient

Heroic surgery

It is in the nature of surgery that surgeons will sometimes find themselves in a position to rescue people from certain death. In the developed world this tends not to happen to trainees because there is always a senior to call on for advice and assistance, and as a consequence most surgeons will have reached a degree of competence by the time they have to shoulder the responsibility on their own.

In Papua New Guinea in 1974 it was different. Our hospital was the end of the line, with no onward referral. Our surgeon was on leave, and I was standing in, when a pick-up truck deposited a woman who had been flown out from the remote highlands. As I walked into the cubicle where she was squatting on the bed, my heart sank. A broken spear shaft was sticking out of her back, and the tip was just visible where it had pierced the skin overlying her manubrium sternum. It was immediately obvious that the necessary surgery was way beyond my level of training, and equally obvious that she was doomed unless the spear was removed.

A chest x ray showed no pneumothorax, and, after discussing it with Peter, a nurse anaesthetist trained in Port Moresby, we decided to give it a crack. While preparations were being made in the theatre, a hurried glance through *Hamilton Bailey's Emergency Surgery* did not reveal any similar case, and *Grant's Anatomy* was frankly frightening.

With the skill of a master, Peter intubated the patient on her side, because the spear sticking out of her back precluded any other possibility. The spear shaft had been snapped off, presumably in order to fit her into the Missionary Aviation Fellowship plane. What remained was the business end, which

was of a hardwood carved in a saw tooth fashion, with barbs that prevented it from being pulled out backwards. I gave it a tentative pull anyway, and to our surprise it dislodged and could be extracted without too much difficulty. The tip, however, was still poking out of the front and would need an anterior approach.

Laying the patient on her back, we prepared the area, and as I cut down I tried to shut out visions of the anatomical structures that the spear must have passed through in order to transfix the manubrium. I freed the tip by nibbling the bone, and then it was loose, so I gently teased it out. A gush of blood followed, but settled with direct pressure, and the job was done. A second x ray showed a haemopneumothorax, for which a chest drain was needed, but the patient went on to make a full recovery.

What did I learn from this? Primarily that when the situation looks hopeless don't be afraid to have a go. But remember, the patient and the surgeon both need luck on their side.

Martin Christie *consultant neurosurgeon, Walsgrave Hospital, Coventry*

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