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# Telephone triage systems in UK general practice: analysis of consultation duration during the index day in a pragmatic randomised controlled trial

Dr Tim A. Holt<sup>1</sup>  
Mrs Emily Fletcher<sup>2</sup>  
Dr Fiona Warren<sup>2</sup>  
Dr Suzanne Richards<sup>2</sup>  
Professor Chris Salisbury<sup>3</sup>  
Dr Raff Calitri<sup>2</sup>  
Professor Colin Green<sup>2</sup>  
Professor Rod Taylor<sup>2</sup>  
Professor David A Richards<sup>2</sup>  
Ms Anna Varley<sup>4</sup>  
Professor John Campbell<sup>2</sup>

1. Nuffield Department of Primary Care Health Sciences, Oxford University
2. Exeter Medical School, University of Exeter
3. Academic Unit of Primary Health Care, University of Bristol
4. Faculty of Medicine and Health Sciences, University of East Anglia

Corresponding author:

Dr Tim A. Holt  
Nuffield Department of Primary Care Health Sciences  
Radcliffe Observatory Quarter  
Woodstock Rd  
Oxford  
OX2 6GG  
[tim.holt@phc.ox.ac.uk](mailto:tim.holt@phc.ox.ac.uk)  
Tel: 01865 289281

## HOW THIS FITS IN

- Telephone triage is a commonly used approach for handling requests for ‘same day’ GP appointments.
- The ESTEEM trial measured the impact on primary care workload of introducing GP-led or Nurse-led telephone triage compared with continuing usual care.
- This study uses ESTEEM data to measure the impact on clinician-patient contact time on the day of the request.
- It suggests no overall reduction with telephone triage, although Nurse-led triage reduced GP-patient contact time.

## **ABSTRACT**

### **Background**

Telephone triage is an increasingly common means of handling requests for 'same day' appointments in general practice.

### **Aim**

To determine whether telephone triage (GP-led or nurse-led) reduces clinician-patient contact time on the day of the request (the index day), compared with usual care.

### **Design and setting**

42 practices in England recruited to the ESTEEM trial.

### **Method**

We measured duration of initial contact for all ESTEEM trial patients consenting to case notes review, and that of a sample of subsequent face to face consultations, to produce composite estimates of overall clinician time during the index day.

### **Results**

Data were available from 16,711 initial clinician-patient contacts, plus 1,290 GP and 176 nurse face to face consultations. The mean (SD) duration (minutes) of initial contacts in each arm was: GP triage 4.0 (2.8); nurse triage 6.6 (3.8); usual care 9.5 (5.0). Estimated overall contact duration (including subsequent contacts on the same day) was 10.3 minutes for GP triage, 14.8 for nurse triage, and 9.6 for usual care. In nurse triage, more than half the duration of clinician contact (7.7 minutes) was with a GP. This was less than the 9.0 minutes of GP time used in GP triage.

### **Conclusion**

Telephone triage is not associated with a reduction in overall clinician contact time during the index day. Nurse-led triage is associated with a reduction in GP contact time but with an overall increase in clinician contact time. Individual practices may wish to interpret the findings in the context of the available skill mix of clinicians.

## BACKGROUND

There is an increasing demand for UK primary care services, with workload increasing by 62% between 1995 and 2008 [1]. General practices have struggled to meet this challenge and difficulties with access have become a major source of patient dissatisfaction [2] and practitioner stress [3]. Practices have been encouraged to develop flexible models of access tailored to local needs [4]. Telephone triage, in which a patient requesting a face to face appointment is, in the first instance, offered a call back from a doctor or nurse, is increasingly being adopted in an attempt to manage demand. During the telephone call, the need for an appointment can be assessed and the most appropriate management plan agreed, including a face to face follow-up consultation if appropriate. Because a proportion of patients do not immediately require any further contact extending beyond the telephone call, this system would appear to be more efficient than the usual care arrangement in which face to face appointments are provided without triage. The ESTEEM trial tested this assumption and investigated the effectiveness and cost consequences of GP-led telephone triage and telephone triage led by nurses supported by decision support software [5]. ESTEEM enrolled 20 990 patients requesting a 'same-day' appointment with a GP registered with 42 practices across four recruitment sites in England. Practices were randomly allocated to provide GP-led triage, nurse-led triage (supported by computer decision support software) or usual care. Practitioners providing triage had the usual access to the patients' health records. The trial identified that triaged patients were, in fact, more likely to require further consultations over the subsequent 28 days and that, whether the triage was provided by GPs or nurses, the overall health economic costs were almost identical to usual care. There was no cost saving to the NHS afforded by telephone triage, and the workload appeared to have been redistributed rather than reduced.

However, practices may introduce triage mechanisms in order to manage and moderate demands for urgent care from a GP on the same day, rather than to reduce workload overall. Also, telephone triage may mean that subsequent face to face consultations (where necessary) are shorter, since some of the history will have already been obtained. This paper examines the duration of consultations and overall clinician time provided on the day of the appointment request, with the intent of answering three separate questions: (i) irrespective of the outcomes over a longer interval, does telephone triage help clinicians complete 'today's work' in a shorter time compared with usual care?; (ii) is an initial triage telephone call associated with a reduction in the duration of a subsequent face to face consultation, where this is needed; and (iii) does telephone triage reduce the same day workload of GPs by diverting some of this to nurses?

## **METHODS**

The full methods employed within the ESTEEM trial are published elsewhere [5]. The duration of the telephone triage contact (or first contact, usually face to face in usual care practices) was recorded using a standard case report form, on which clinicians recorded the start and end times of consecutive consultations. In addition, GPs and nurses from all participating practices were asked to record the start and end times of all of their face to face consultations on two, randomly selected, days during the study data collection period. The sampling days were chosen to occur during weeks 2 and 3 of a planned 4-week period for the triage intervention (i.e. during the middle of the trial recruitment). For each practice, one of the days selected was a Monday or a Friday and the other was a Tuesday, Wednesday or Thursday. We subsequently identified the recorded durations for patients that had requested a same-day appointment either that day or the previous day (and were thus in the ESTEEM trial), and excluded all other patients' face to face appointments from the analysis. This ensured that the small proportion of ESTEEM patients requesting a same-day appointment but not receiving one until the following day would still be included in this analysis.

We identified different contact types (initial face to face consultation in usual care; GP-led telephone triage call; nurse-led telephone triage call; face to face consultations with a GP following a GP-led or a nurse-led triage call; face to face consultations with a nurse following a GP-led or a nurse-led telephone triage call; telephone consultation with a GP following a nurse triage call). We compared the duration of face to face contacts with a GP that had followed a triage call with those occurring in usual care.

For each trial arm, we estimated the overall composite clinician–patient contact time on the index day, subdivided into contact time with a GP and with a nurse. This estimate was based on the mean duration of the individual components and the frequencies with which each contact type occurred on the index day. The proportion of patients requiring either one contact (the triage call) or two (triage call plus a face to face consultation) were measured in the trial through case notes reviews. Only patient management pathways that were experienced by at least 1% of patients managed on the index day contributed to the patient–clinician contact time estimate. Average durations for each contact type were derived from the case report forms or from the sample of face to face GP/nurse contacts. In the case of GP telephone consultations following a nurse triage call, duration estimates were not measured in the trial, so an estimate of duration was taken from a source of standard unit timings [6]. The proportions of patients experiencing each management pathway, and the estimated time per patient for each pathway, were combined to produce the overall estimates of patient time

spent with a GP or a nurse on the index day. Because these were composite estimates, it was not possible to derive standard deviations (SD) for these outcomes, even though the SD was known for the individual components.

## RESULTS

Consultation duration data were available from the initial contact of 16,711 patients entered into the ESTEEM study [5]. In addition, 1,290 face to face consultations with a GP and 176 face to face consultations with a nurse on the index day or subsequent day were timed. The estimated composite durations of clinician-patient contact time were informed by data for 15,396 patients (5,138 in usual care, 5,001 in GP triage and 5255 in nurse triage) for whom data on management on the index day were available and who followed a management care pathway used by >1% of patients in that trial arm.

All 42 practices in the trial contributed to the sample of face to face consultation durations. In one case a practice collected data on just one day (a Tuesday, without sampling a Monday or Friday).

Table 1 gives the demographic characteristics with respect to age, gender and deprivation status of the 1,466 patients for whom we collected face to face consultation duration in this sub-study. No differences were found between the characteristics of this group when compared with the entire population of trial participants.

Table 2 gives: the durations of initial contact (telephone triage in triage arm practices, mostly a face to face contact in usual care practices [5]); the estimated overall clinician-patient contact time for all patients; and the duration of face to face contacts following triage in the triage arms. The mean (standard deviation) of an initial telephone triage contact for GPs was 4.0 (2.8) and for nurses 6.6 (3.8) minutes. This compared with 9.5 (5.0) minutes for an initial contact (usually face to face) in usual care. The estimated composite overall duration of clinician-patient contact on the day of the request was 10.3 minutes for GP-led triage, 14.8 for nurse-led triage, and 9.6 for usual care. In nurse-led triage, more than half the duration of contact (7.7 minutes) was with a GP. This was less than the 9.0 minutes of GP contact time observed following introduction of GP triage and the 9.1 mins observed in usual care. There was no clinically significant difference in the overall GP time required between GP-led triage and usual care. The mean estimated duration of a GP face to face consultation that followed a GP triage call was longer than the duration of a GP face to face consultation in usual care (12.4 vs 9.8 mins). For those that followed a nurse triage call, the estimated mean duration was 11.5 mins.

## **DISCUSSION**

### **Summary**

Despite the possibility that telephone triage may be a more time-efficient way of managing workload on the index day, this analysis of ESTEEM trial data indicates that there is no overall clinician time saved when comparing GP- or nurse-led triage with usual care. Nurse-led triage saves GP time on the index day, even though overall clinician (GP and nurse) contact time is increased. Although it might be reasonable to speculate that face to face consultations may be completed in less time if preceded by a telephone triage call (as a clinician has been made aware of the problem, and a preliminary consultation undertaken), this study suggests that the face to face consultation duration is longer for triaged patients than those seen in usual care. However, in some cases the patient may have consulted a different clinician face to face from the one providing the triage contact, and it is not clear whether or how the recording of a patient's history might impact on the subsequent use of time. It is also difficult to compare the two groups directly, because the first (face to face consultations following triage) only included patients whose problems were not, for whatever reason, resolved by a telephone consultation, whilst the latter included people with all types of problem, some of which may have been possible to resolve by telephone.

### **Strengths and limitations**

This analysis involved a large sample of consultations from contemporary UK practice collected in the context of a large cluster randomised controlled trial. The clinicians involved in gathering the data had received standardised training in study processes, including documenting consultation duration during a four-week run-in period prior to beginning live data collection for the trial. The duration data for the face to face contacts following triage used in this analysis were gathered during days selected randomly in the middle of the trial. However, there will inevitably be some inaccuracy in measurement resulting from time pressures during busy, routine care being associated with some incomplete recording and subsequent missing data. For the sample of face to face consultations, it was not known how many consultations were expected to occur, and so, whilst practices were actively encouraged to record timings for all such consultations on the sampling days, the completeness of this process could not be evaluated. For the composite estimate of overall clinician contact time, we relied on published estimates for GP telephone consultation duration that followed a nurse triage call, although this applied to a very small minority of contacts (~1%). For the purposes of estimating mean consultation duration we included in the sample consultations that had occurred

on the day after as well as the index day, but consultations scheduled over longer intervals were not included.

### **Comparison with existing literature**

A number of studies have investigated telephone triage systems, but relatively few have measured consultation duration as an outcome [7]. Jiwa et al reported a telephone consultation duration of less than 5 minutes in over 92% of calls following introduction of a telephone triage system [8]. Richards et al studied the impact on workload and costs following introduction of a nurse-led triage system using a multiple interrupted time series analysis [9]. They reported a reduction in GP time, but a substantial increase in overall time involved in managing the patient (mean increase 1.7 minutes,  $P < 0.001$ ). Mohammed et al reported the duration of 128,717 telephone triage calls in an out of hours provider service in England and Wales in 2012 [10]. They also found that GP telephone triage calls were shorter than those provided by a nurse practitioner. However this study population was different from our study, which investigated consultations during normal working hours and involved clinicians who had access to the patients' complete health records. McKinstry et al randomised two general practices to provide GP-led telephone triage or usual care without triage, adopting use of doctor time as the primary outcome [11]. They found that telephone triage consultations were shorter than face to face consultations in usual care, but that those managed through triage were more likely to re-consult over the following two weeks. This finding concurs with the results of the main ESTEEM trial, which confirmed this greater tendency to re-consult in patients managed by triage (GP-led or Nurse-led) compared to usual care, with no difference between the three arms in total NHS costs [5].

### **Implications for practice and research**

The ESTEEM trial [5] has yielded large amounts of data investigating the workload implications of telephone triage arrangements in current practice. This study adds to the message of the main trial, that telephone triage, whether undertaken by a doctor or a nurse, appears not to offer added efficiency in terms of resource use than usual care. Nurse-led triage, supported by decision support software, is associated with a reduction in overall GP contact time during the index day, even though overall clinician contact time is increased compared to usual care. However, individual practices may wish to interpret the findings in the context of the available skill mix of clinicians.



### **Competing interest statement**

No competing interests to declare.

### **Contributor statement**

All authors contributed to the design and conduct of the research, to the interpretation of the results, and to the drafting of the manuscript.

### **Funder**

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### **Ethical approval**

Research ethics approval was obtained from South West No 2 Research Ethics Committee (reference number 09/H0202/53).

This manuscript represents an accurate and open account of the study conducted. No important aspects of the study, as planned, have been omitted. The ESTEEM trial was registered with the ISRCTN (20687662). The trial protocol is published at: <http://www.trialsjournal.com/content/14/1/4>

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**Table 1 Distribution of patient characteristics in the sub-study**

	<b>Usual care (N=692)</b>	<b>GP Triage (N=302)</b>	<b>Nurse Triage (N=472)</b>
Gender n(%)			
Male	274 (39.6)	120 (39.7)	184 (39.0)
Female	418 (60.4)	182 (60.3)	288 (61.0)
Age category n (%)			
Under 5 years	63 (9.1)	26 (8.6)	51 (10.8)
5–11 years	39 (5.6)	24 (8.0)	24 (5.1)
16–24 years	88 (12.7)	31 (10.3)	54 (11.4)
25–59	324 (46.8)	118 (39.1)	204 (43.2)
60–74 years	118 (17.1)	60 (19.9)	89 (18.9)
75 and over	60 (8.7)	43 (14.2)	50 (10.6)
Deprivation (IMD 2010 quintile based on rank); n (%)			
Quintile 1 (most deprived)	62 (9.0)	8 (2.7)	42 (8.9)
Quintile 2	146 (21.1)	46 (15.2)	126 (26.8)
Quintile 3	155 (22.4)	90 (29.8)	103 (21.9)
Quintile 4	181 (26.2)	78 (25.8)	119 (25.3)
Quintile 5 (least deprived)	148 (21.4)	80 (26.5)	80 (17.0)

**Table 2 Duration of consultations during trial**

	Usual Care			GP Triage			Nurse Triage		
<b>Duration of consultation (based on clinician form<sup>a,b</sup> data)</b>									
First management/triage contacts only <sup>c</sup> (minutes; mean, (sd), n)	9.5	(5.0)	5693	4.0	(2.8)	5508	6.6	(3.8)	5510
<b>Duration of face to face consultations for the sample of ESTEEM patients<sup>d</sup></b>									
Duration of GP face to face consultations on the day of, or the day after, index consultation request (minutes); mean, (sd), n	9.8	(5.1)	631	12.4	(7.1)	244	11.5	(6.4)	415
Duration of nurse/nurse practitioner face to face consultations on the day of, or the day after, index consultation request (minutes); mean, (sd), n	11.0	(6.6)	61	13.9	(8.8)	58	11.0	(8.1)	57
<b>Estimated composite patient–clinician contact duration on the index day<sup>e</sup></b>									
	<b>UC</b>			<b>GPT</b>			<b>NT</b>		
Overall estimated patient–clinician contact duration (minutes)	9.6 <sup>f</sup>			10.3			14.8		
Estimated patient–GP contact duration (minutes)	9.1			9.0			7.7		
Estimated patient–nurse contact duration (minutes)	0.6			1.3			7.1		

<sup>a</sup>Clinician form data included only if dated within 7 days of the index day (UC) or on the index day (GPT/NT). <sup>b</sup>Includes 98 clinician forms recorded as 'patient did not attend', but did include duration data. <sup>c</sup>A triage contact is defined as a GP telephone contact on the index date (GPT) or a nurse telephone or GP telephone contact on the index date (NT). A first management contact in UC is defined as any contact within 7 days of the index date. <sup>d</sup>Durations of face to face consultations recorded by form completion or electronically from practice computer system. <sup>e</sup>Patients who did not attend any within practice contacts on the index day, or who were first managed outside the practice, were excluded. <sup>f</sup>Rounding up discrepancy.

## Summary for the print version (800 words)

### BACKGROUND

Telephone triage, in which a patient requesting a face to face appointment is, in the first instance, offered a call back from a doctor or nurse, is increasingly being adopted to manage appointment demand in general practice. The ESTEEM trial investigated the effectiveness and cost consequences of GP-led telephone triage and telephone triage led by nurses supported by decision support software. ESTEEM enrolled 20,990 patients requesting a 'same-day' appointment with a GP registered with 42 practices across England. Practices were randomly allocated to provide GP-led triage, nurse-led triage or usual care. The trial identified that triaged patients were, in fact, more likely to require further consultations over the subsequent 28 days and that, whether the triage was provided by GPs or nurses, overall health economic costs were almost identical to usual care.

This paper addresses three further questions: (i) irrespective of the outcomes over a longer interval, does telephone triage help clinicians complete 'today's work' in a shorter time compared with usual care?; (ii) is an initial triage telephone call associated with a reduction in the duration of a subsequent face to face consultation, where this is needed; and (iii) does telephone triage reduce the same day workload of GPs by diverting some of this to nurses?

### METHODS

The duration of telephone triage contacts (or first contact, usually face to face in usual care practices) was recorded. In addition, GPs and nurses from all practices were asked to record the start and end times of all of their face to face consultations on two, randomly selected, days during the trial. We subsequently identified the patients that had requested a same-day appointment either that day or the previous day (and were thus in the ESTEEM trial), and excluded all other patients' face to face appointments from the analysis.

For each trial arm, we estimated the overall composite clinician–patient contact time based on the mean duration of the individual components and the frequencies with which each contact type occurred on the index day. Only patient management pathways that were experienced by at least 1% of patients contributed to the patient–clinician contact time estimate. In the case of GP telephone consultations following a nurse triage call, duration estimates were not measured in the trial, so an estimate of duration was taken from a source of standard unit timings. Because these

were composite estimates, it was not possible to derive standard deviations (SD) for these outcomes, even though the SD was known for the individual components.

## **RESULTS**

Consultation duration data were available from the initial contact of 16,711 patients entered into the ESTEEM study. In addition, 1,290 face to face consultations with a GP and 176 with a nurse on the index day or subsequent day were timed in all 42 practices. The estimated composite durations were informed by data for 15,396 patients who followed a management care pathway used by >1% of patients in that trial arm.

The Table gives the durations of initial contact; the estimated overall clinician-patient contact time for all patients; and the duration of face to face contacts following triage in the triage arms. The estimated composite overall duration of clinician-patient contact on the day of the request was 10.3 minutes for GP-led triage, 14.8 for nurse-led triage, and 9.6 for usual care. In nurse-led triage, more than half the duration of contact (7.7 minutes) was with a GP. This was less than the 9.0 minutes of GP contact time observed following introduction of GP triage and the 9.1 mins observed in usual care. There was no clinically significant difference in the overall GP time required between GP-led triage and usual care. The mean estimated duration of a GP face to face consultation that followed a GP triage call was longer than the duration of a GP face to face consultation in usual care (12.4 vs 9.8 mins).

## **DISCUSSION**

This analysis indicates that there is no overall clinician time saved on the day of the appointment request (the index day) when comparing GP- or nurse-led triage with usual care. Nurse-led triage saves GP time on the index day, even though overall clinician (GP and nurse) contact time is increased. This study also suggests that the face to face consultation duration is longer for triaged patients than those seen in usual care.

ESTEEM has yielded large amounts of data investigating the workload implications of telephone triage arrangements in current practice. This study adds to the message of the main trial, that telephone triage, whether undertaken by a doctor or a nurse, appears not to offer added efficiency in terms of resource use than usual care. However, individual practices may wish to interpret the findings in the context of the available skill mix of clinicians.