

## Accessibility, acceptability, and effectiveness in primary care of routine telephone review of asthma: pragmatic, randomised controlled trial

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### Abstract

**Objective** To determine whether routine review by telephone of patients with asthma improves access and is a good alternative to face to face reviews in general practices.

**Design** Pragmatic, randomised controlled trial.

**Setting** Four general practices in England.

**Participants** 278 adults who had not been reviewed in the previous 11 months.

**Intervention** Participants were randomised to either telephone review or face to face consultation with the asthma nurse.

**Main outcome measures** Primary outcome measures were the proportion of participants who were reviewed within three months of randomisation and disease specific quality of life, as measured by the Juniper mini asthma quality of life questionnaire. Secondary outcome measures included the validated "short Q" asthma morbidity score, nursing care satisfaction questionnaire score, and length of consultation.

**Results** Of 137 people randomised to telephone consultation, 101 (74%) were reviewed, compared with 68 reviewed (48%) of the 141 people in the surgery group, a difference of 26% (95% confidence interval 14% to 37%;  $P < 0.001$ ; number needed to treat 3.8). Three months after randomisation the two groups did not differ in the Juniper score (risk difference  $-0.07$  (95% confidence interval  $-0.40$  to  $0.27$ ) or in satisfaction with the consultation (risk difference  $-0.07$  ( $-0.27$  to  $0.13$ )). Telephone consultations were on average 10 minutes shorter than reviews held in the surgery (mean difference 10.7 minutes (12.6 to 8.8;  $P < 0.001$ )).

**Conclusions** Compared with face to face consultations in the surgery, telephone consultations enable more people with asthma to be reviewed, without clinical disadvantage or loss of satisfaction. A shorter duration means that telephone consultations are likely to be an efficient option in primary care for routine review of asthma.

### Introduction

Regular review of patients with asthma reduces morbidity and is endorsed as good practice by UK and

international guidelines.<sup>1 2</sup> A large US trial showed that telephone review has the potential to reduce morbidity, drug use, and use of health services in patients with a range of chronic disorders.<sup>3</sup> We know of no study that has addressed the role of telephone consultations in the routine review of chronic disease in primary care in Britain. We hypothesised that telephone consultations improve access of patients to care and are an acceptable and effective alternative to face to face consultations for the provision of routine care of patients with asthma.

### Methods

**Recruitment**—The four participating general practices had nurses who were trained and experienced in providing asthma care (see [bmj.com](http://bmj.com) for details). From their computerised asthma registers the practices identified adults who had asked for a bronchodilator inhaler prescription in the previous six months but who had not had a routine asthma review in the preceding 11 months. Patients were excluded if asthma had been diagnosed in the previous year, if they had chronic obstructive pulmonary disease, if communication difficulties made a telephone consultation impossible, or (at the general practitioner's request) for major social or medical reasons. We wrote to all eligible patients inviting them to take part in the study.

**Randomisation**—Patients were centrally randomised in blocks of 10 to ensure that approximately equal numbers of patients were allocated to each arm of the study.

**Intervention**—Patients randomised to the telephone review group were sent a letter from their practice informing them that they would receive a telephone review and that they should expect a call from an asthma nurse within a month. Nurses were told to make up to four attempts to contact the patient by phone. The nurses were given no instructions about the content of the review except that it should reflect their normal practice and be appropriate to each patient's clinical need. Details about the consultation, including failed attempts at phone calls and the duration of the consultation, were recorded immediately after the review on a piloted consultation record. Nurses arranged any follow up consultations (whether in the surgery or by phone) they deemed clinically necessary. Patients were free to arrange any consultations they wished.

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**Control group**—Patients randomised to the face to face consultation arm were sent a written invitation to make an appointment to see the asthma nurse within a month. Clinical care and follow up were the same as for the intervention group but without a telephone option.

**Outcome measures**—Primary outcome measures were the proportion of patients reviewed within three months of randomisation and change in asthma related quality of life, as measured by the Juniper mini asthma quality of life questionnaire.<sup>4</sup> This validated instrument is widely used in asthma research.<sup>5</sup> It has 15 questions (responses are rated on a scale from 1 (greatest impairment) to 7) and is responsive to change with a minimum important difference of 0.5 for both improvement and deterioration in clinical condition.<sup>4 6</sup>

To measure asthma morbidity we used the “short Q” a validated score incorporating three questions recommended by the Royal College of Physicians as outcome indicators for routine use in asthma care.<sup>7 8</sup> We used the nursing care satisfaction questionnaire to measure satisfaction with the consultations.<sup>9 10</sup> Other secondary outcome measures were the duration of consultation, as recorded by the nurses at the end of the consultation, and use of healthcare resources during the three month study period, obtained by the

**Table 1** Baseline characteristics of patients

Characteristic	Type of consultation	
	Face to face (n=141)	Telephone (n=137)
Number (%) of women	82 (58)	81 (59)
Mean (SD) age (years)	56.4 (17.5)	54.6 (17.5)
Mean (SD) scores on Juniper mini asthma quality of life questionnaire:		
Overall	5.16 (1.17)	5.17 (1.22)
Symptoms	4.96 (1.36)	4.92 (1.34)
Activity limitation	5.61 (1.62)	5.62 (1.39)
Emotional function	5.03 (1.52)	5.01 (1.56)
Environmental stimuli	4.89 (1.43)	4.90 (1.55)
Mean (SD) Short Q asthma morbidity score	1.85 (1.79)	2.09 (2.02)

nurses through a search of electronic and paper general practice records. Baseline questionnaires were sent with the initial letter to the patients. Follow up questionnaires on morbidity and satisfaction with the consultation were sent to the patients at three months.

**Sample size and statistical methods**—An 80% power, at the 5% significance level (two tailed test), of detecting a 20% difference in the proportion of patients reviewed from 30% to 50% required 206 patients.<sup>11</sup> A difference of 0.5 in the Juniper scores (SD 0.78) required 180 patients.<sup>4</sup> Equality in terms of quality of life was regarded as less than a 0.5 difference on the Juniper score.<sup>6</sup> To allow for an anticipated 25% of subjects failing to complete questionnaires, we estimated that we needed to recruit 225 patients. We used Student's *t* test to compare normally distributed continuous data and the Mann-Whitney U test to compare non-parametric data. We used the  $\chi^2$  test or Fisher's exact text (for small numbers) to analyse categorical data.

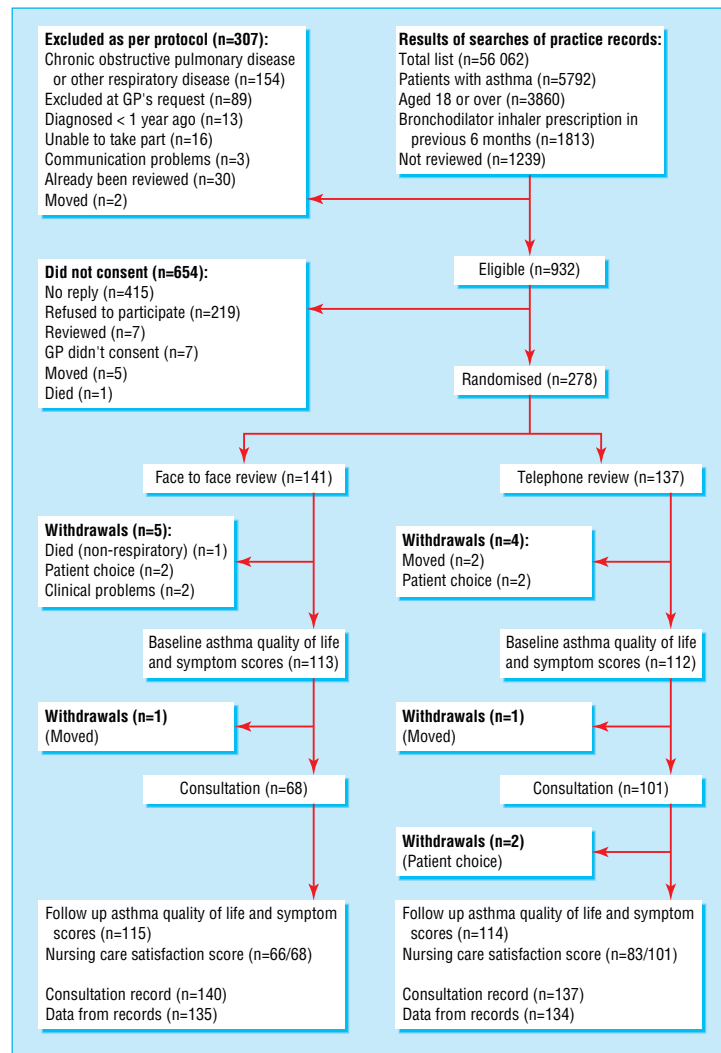
**Results**

**Recruitment**—Of the 932 eligible patients 278 agreed to participate in the study (figure). Participants were older than the overall eligible population (mean age 55.5 versus 48.6 years;  $P < 0.001$ ). Baseline characteristics were similar in the two groups (table 1).

**Proportion reviewed**—On an intention to treat analysis, 101 of the 137 patients (74%) allocated to the telephone arm were reviewed, compared with 68 of the 141 patients (48%) in the face to face consultation arm (risk difference 26% (95% confidence interval 14% to 37%;  $P < 0.001$ ; number needed to treat 3.8 (2.7 to 7.1)).

**Duration and content of review and patients' satisfaction**—Telephone consultations were shorter than surgery consultations (mean durations 11.2 and 21.9 minutes, a difference of 10.7 minutes (8.8 to 12.6;  $P < 0.001$ )). This difference remained even when the 141 abortive telephone calls and five missed appointments were allowed for. The two types of consultation addressed similar aspects of asthma care, but peak flow measurements were more likely to be discussed in the face to face reviews. The groups were equally satisfied with the consultation (for a table of satisfaction scores see bmj.com).

**Morbidity**—Quality of life scores and symptom scores measured three months after randomisation were similar in the two groups (table 2). The number of acute asthma exacerbations and the use of healthcare resources did not seem to differ between the groups (table 3), though the trial did not have adequate power to detect differences in these secondary outcome measures.



Flow of patients through the trial

## Discussion

Telephone consultations enabled 26% more people with asthma to be reviewed than surgery consultations, without any apparent clinical disadvantage or loss of satisfaction. Because of their shorter duration, telephone consultations may be an efficient option in primary care for the routine review of people with asthma.

### Limitations and strengths of the study

It was not possible to conduct a blinded study, so bias may have been introduced. To minimise the risk of allocation bias we opted for centralised randomisation by an independent company, and to minimise information bias we gave standardised training on all the study procedures to the nurses. A blinded quality assessment that checked completeness and accuracy of data extracted from records in a random sample of participants from each practice failed to detect any systematic errors in data extraction.

Despite the broad entry criteria, two factors limit the generalisability of our findings. Our practices were all "asthma interested"—they all had specialist nurses experienced in providing asthma care, potentially enhancing their skills in telephone consultation. Also, our participants were slightly older than the total eligible population and may not be wholly representative of all adults with asthma in these practices.

Our study aimed to reflect, as far as possible, normal care of patients with asthma in the participating practices. We asked nurses not to change their clinical practice. Using validated instruments we obtained data on several clinical and practice related outcomes.

### Interpretation of findings in relation to other studies

In keeping with other studies, telephone reviews were of shorter duration than the face to face consultations, though the content was similar, apart from practical procedures such as peak flow measurements.<sup>12</sup> The distribution of the timings of the consultations in the two groups suggest that surgery consultations may have been paced to use the available 15, 20, or 30 minute appointments, whereas a telephone review could take as short or as long a time as needed. The nurses who undertook the reviews observed that the telephone consultations felt more "focused," which may reflect the recognised tendency for telephone interactions to be more goal oriented, with fewer digressions and achieving shared tasks faster.<sup>13</sup> Despite the shorter duration of telephone consultations there was no evidence of dissatisfaction with the time spent. Future studies of the role of telephone consultations for asthma should include a formal cost effectiveness analysis and a qualitative assessment of the perceptions of users and providers of care.

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- 1 British Thoracic Society. The British guidelines on asthma management: 1995 review and position statement. *Thorax* 1997;52(suppl 1):S1-20.
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**Table 2** Mean (SD) morbidity and quality of life scores at three months follow up

Questionnaire	Type of consultation		Difference (95% CI)	P value
	Face to face (n=141)	Telephone (n=137)		
Juniper mini asthma quality of life questionnaire:				
Overall	5.22 (1.14)	5.15 (1.28)	-0.07 (-0.40 to 0.27)	0.69
Symptoms	5.14 (1.34)	5.04 (1.35)	-0.10 (-0.46 to 0.26)	0.59
Activity limitation	5.54 (1.44)	5.55 (1.39)	-0.01 (-0.38 to 0.38)	0.99
Emotional function	5.00 (1.51)	5.01 (1.68)	0.09 (-0.41 to 0.43)	0.97
Environmental stimuli	4.91 (1.36)	4.78 (1.46)	-0.13 (-0.50 to 0.25)	0.50
Short Q asthma morbidity score	1.96 (1.96)	2.10 (2.16)	0.41 (-0.41 to 0.68)	0.62

**Table 3** Number of asthma or respiratory consultations and acute episodes of asthma

	Patients in face to face consultation group (n=141)		Patients in telephone consultation group (n=137)		P value for difference
	No	Median (range)	No	Median (range)	
GP consultations	34	0 (0 to 3)	27	0 (0 to 5)	0.57
Nurse consultations	20	0 (0 to 2)	22	0 (0 to 2)	0.95
Outpatient consultations	2	0 (0 to 2)	2	0 (0 to 2)	0.97
Accident and emergency consultations	0	0	0	0	1
Acute exacerbations of asthma	5	0 (0 to 1)	7	0 (0 to 2)	0.68
Emergency bronchodilation	1	0 (0 to 1)	1	0 (0 to 1)	0.97
Steroid courses for asthma	3	0 (0 to 1)	5	0 (0 to 2)	0.64
Hospital admissions for asthma	0	0	0	0	1

## What is already known on the topic

Regular review of patients with asthma reduces morbidity and is endorsed as good practice by UK and international guidelines, but only about a third of patients attend for their annual review

Most studies of telephone consultation in primary care have focused on consultations requested by patients rather than their use in the routine review of chronic disease

## What this study adds

Telephone consultations enable more people with asthma to be reviewed

Telephone consultations are shorter than face to face consultations, without any apparent clinical disadvantage

Patients are satisfied with telephone consultations

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