The effect of interventions to alter the consultation length of family physicians:
a systematic review

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ABSTRACT

Background
Observational studies have shown differences in process and outcome between the consultations of primary care physicians whose average length of consultation differs, however, these differences may be due to self selection.

Aim
To assess the effectiveness and cost effectiveness of interventions to alter primary care physicians' consultation length.

Design of study
Systematic review with narrative analysis.

Method
Data sources included Medline, EMBASE, the Cochrane Controlled Trials Register and Effective Practice and Organisation of Care Group specialised register, the NHS National Research Register and author contacts. To be eligible, studies had to be controlled trials. They had to evaluate interventions to alter the consultation length of primary care physicians, and provide objectively measured process or outcome data. Data were extracted independently using agreed criteria and disagreements resolved by discussion.

Results
Six articles describing four trials were included. All took place in the UK and tested short term changes in the time allocated to each patient, and all had methodological weaknesses, particularly due to non random allocation of patients. Altering appointment length resulted in modest changes in average consultation length. There were no consistent differences in problem recognition, examination, prescribing, referral or investigation rates. There was some evidence that blood pressure was checked more frequently and smoking discussed more often when more time was available. None of the interventions were associated with differences in patient satisfaction. No trials examined cost effectiveness.

Conclusions
Our findings do not provide sufficient evidence to support or resist a policy of altering consultation lengths of primary care physicians. Further trials are needed, focussing on health outcomes and cost effectiveness.

Keywords
consultation; primary care physicians; review, systematic.

INTRODUCTION

In a previous systematic review of observational studies, we concluded that consultations with doctors with longer average consultation lengths than their peers were more likely to include important elements of care, especially lifestyle advice and preventive activities. These doctors also prescribed less and achieved higher levels of patient enablement. Differences were consistent within health care systems with very different average consultation lengths.[1] In the UK context, where the average consultation length is about 9 minutes,[2] the Royal College of General Practitioners has advocated 'longer consultations to coordinate care and explain treatment options to patients'[3] and the GP contract rewards practices with routine 10 minute appointments.[4]

However there may be several confounding factors such as the doctors' style and orientation that mean that average consultation is simply a marker of other, more important, attributes that are not amenable to change by extending consultation length. Increasing consultation length incurs extra costs and, if not associated with a commensurate increase in effectiveness, would reduce efficiency. It has been suggested that the focus of quality should shift from 'how much time' to 'how best to use that time'.[5]

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One way to examine whether or not the link between average consultation length and quality is causal is to study the same doctors consulting at different rates, and this is what we set out to do in this review. Our focus was on the changing length of consultation, but we realised it is likely that interventions to increase or decrease this will do so by altering appointment length. Our specific objective was to assess the effectiveness and efficiency of interventions to alter primary care physicians' consultation length.

This is a version of a Cochrane review, which is available in The Cochrane Library.[6]

METHOD
Search strategy
The search strategy was broad because the words used to describe the concept of 'consultation length' are very general and no appropriate subject heading exists. The following electronic databases were searched: Medline, EMBASE, Cochrane Controlled Trials Register, Cochrane Effective Practice and Organisation of Care Group (EPOC) specialised register, NHS National Research Register. The search strategies for the Medline and Embase combined subject terms for 'general practice', 'consultation' and 'length' with methodological filters. The strategy for Medline is presented in Supplementary Box 1. The strategy for Embase was almost identical, except for slight differences in the subject headings used. Methodological filters were used to restrict the search to systematic reviews, randomised controlled trials, controlled clinical trials and controlled before and after studies.

Selection process
For inclusion the subjects had to be primary care physicians, defined as any medically qualified physician who provides first contact care, whether or not this is restricted to certain patient groups.[7]

How this fits in
Observational studies suggest that family physicians with longer average consultation lengths deliver higher quality care than those who consult more quickly. However in this systematic review of studies where the same doctors consulted at different rates, the benefits seen in observational studies were not replicated.

We included any intervention to alter consultation length, but not interventions aimed solely at making appointment and consultation lengths more congruent if there was no aim to alter consultation length. Studies had to include one or more objectively measured process or outcome measure. Both reviewers independently assessed the electronic records for inclusion. Where insufficient information was present in the electronic record to make this judgement, a copy of the whole article was used. Additional papers were identified from reference lists and contact with authors who had published in the last 20 years.

Data extraction and analysis
Data were extracted independently by both reviewers using a standard form. Where possible, authors were approached for unpublished or missing data. Disagreements in selection and data extraction were resolved by discussion. Studies were included irrespective of their methodological rigour but their quality was assessed independently, using standard EPOC criteria. Given the heterogeneity of included studies, meta-analysis was not attempted, and results are presented narratively. *P*-values are presented as published.

RESULTS
Search results
The MEDLINE search retrieved 639 records; four were selected for inclusion in the review. The EMBASE search retrieved 1159 records; none were selected for inclusion in the review. The Cochrane Controlled Trials Register search retrieved 204 records; three were selected for inclusion in the review (however they were duplicates of records selected from the MEDLINE search). The search of the Cochrane Effective Practice and Organisation of Care Group (EPOC) specialised register retrieved seven records; one was selected for inclusion in the review (however this was a duplicate of records selected from the MEDLINE search). Only one additional study[8] met our inclusion criteria but on closer examination was excluded as it described a secondary analysis of previously published work. Two further references were selected for inclusion in the review from checking the bibliographies of selected items. In total six articles describing four trials were included, as shown in Table 1.

Description of studies
All studies included were conducted in the UK. The earliest trial by Thomas[9] was conducted by a single GP without an appointment system. He randomly allocated patients in whom no diagnosis could be

Table 1. Characteristics of included studies.

Study ID	Methods	Participants	Interventions	Outcomes	Analysis
Morrell 1986	CCT. Non-randomised to surgery sessions with 5, 7. 5 or 10 minute appointments	1 Practice 5 Doctors 60 Surgery sessions 780 Consultations	5, 7.5 and 10 minute appointments (usual appointment, length 6.7 minutes)	Consultation length, examination, prescribing and referral, investigation rates, number of problems and psychological problems identified, language content Re-consultation in 4 weeks	Logistic regression allowing for age and sex of patient. As case mix varied between groups, doctor and patient initiated consultations were analysed separately for several outcomes
Ridsdale 1989	CCT. Non-randomised to surgery sessions with 5, 10 or 15 minute appointments	1 Practice 2 Doctors 914 Consultations	5, 10 or 15 minute appointments (usual appointment length 10 minutes)	Consultation length, examination, number of problems and psychological problems identified, language content. Re-consultation in 4 weeks	Regression, account for age and sex of patient and consulting doctor
Thomas 1978	RCT. Random allocation by participating doctor – method not stated	1 Practice 1 Doctor 52 Surgery sessions 200 Patients in whom no diagnosis could be made	Patients randomly assigned to 1 of 4 groups: long consultation with or without treatment; short consultation with or without treatment. The participating doctor terminated short consultations as soon as possible and aimed to make the long consultations last for more than 10 minutes	Re-consultation	χ^2
Wilson 1992	CCT. Non-randomised to surgery sessions with examination, prescribing, usual or 10 minute appointments (run in control sessions not included)	10 Practices 16 Doctors 208 Surger sessions 2957 Consultations	10 minute appointments	Consultation length, referral and investigation rates, health promotion procedures and examinations. Re-consultation	By patient, no account for clustering by doctor

made to one of four management options: short consultation and prescription, long consultation and prescription, short consultation no prescription, long consultation no prescription. Short consultations averaged 3.7 minutes and long consultations 10 minutes. The outcome measure was whether the patient returned within four weeks, with either the same or a different complaint.

In a trial involving five doctors in one academic general practice, Morrell allocated patients non-randomly to consulting sessions of appointment lengths of 5, 7.5 or 10 minutes, spread over representative times of the day and days of the week.[10,11] Process measures included consultation length, number of problems and psychological problems recorded, rates of examination, prescribing, investigation and referral, and verbal content. Outcomes included patient satisfaction (using an unvalidated questionnaire) and reconsultation rates. Doctor stress was also assessed by blood pressure measurement and questionnaire.

In a similar trial involving two doctors in a suburban practice, Ridsdale allocated to

consulting session booked at 5, 10 or 15 minute intervals.[12] Patients who had consulted in the previous 4 weeks were excluded. Process and outcome measures were the same as Morrell except that neither referral nor investigation rates nor doctor stress were assessed.

In the fourth trial, Wilson included 16 doctors in 10 practices that usually had appointments of between 5 and 7.5 minutes but wished to increase appointment length.[13,14] Intervention sessions were booked at 10 minutes, spread across representative times and days of the week. Control sessions were booked at the usual interval. Process measures included consultation length, number of problems identified, health promotion interventions and prescribing, investigation and referral rates. Outcomes included reconsultation rate and patient satisfaction, using an unvalidated questionnaire. Doctor stress was measured using a validated mood adjective checklist.

Methodological quality of included studies
Non-random allocation in the trials of different appointment lengths risked potential problems with case mix. In Morrell, 71% of 5-minute

Table 2. Consultation length.

Author	Appointment length (mins)	Consultations (*n*) doctor/patient initiated	Median length (mins) doctor/patient initiated	Mean (95% CI)
Morrell 1986	5	65/155	4.3[a]/5.5	
	7.5	96/117	6.4/6.7	
	10	88/102	7.0/7.9	
Ridsdale 1989	5	-/339	-/5.9	6.6 (6.2 to 7.0)
	10	-/259	-/7.5	8.0 (7.5 to 8.5)
	15	-/316	-/7.9	9.2 (8.6 to 9.8)
Wilson 1992	6–7.5	-/1496	-/6[b]	7.16
	10	-/1461	-/7	8.25

[a]*Not tested statistically.* [b]*(P<0.001 Mann Whitney test).*

appointments were patient initiated compared with 56 and 53% of 7.5 and 10 minute appointments, respectively, because of greater availability of shorter appointments. As patient-initiated consultations are more likely to be for acute illness, comparison of examination rates and so on is problematic. Case mix was not reported by Ridsdale, but found to be similar (in terms of age, sex and whether the consultation was for a new or old problem) by Wilson. All three trials had multiple outcome measures assessed by a variety of methods including encounter sheets, patient questionnaire and audiotape analysis. Levels of agreement for extraction of data from the medical record and audiotape were variable. The design of all trials prevented concealment of allocation to participating doctors. In all the three trials involving more than one doctor the unit of analysis was the patient, and only Ridsdale accounted for clustering effects by doctor. Only Morrell included a sample size calculation and in this it was acknowledged that the study was insufficiently powered to detect changes in uncommon events.

Effects on process and outcome
Consultation length. All three trials that examined the effect of changing appointment length on consultation length found differences, and in the two trials where this was tested statistically these differences were significant (Table 2). In Morrell, consultation length was measured by audiotape analysis. For 5, 7.5 and 10 minute appointment, median lengths of doctor-initiated appointments were 4.3, 6.4 and 7.0, respectively, and patient-initiated appointments 5.5, 6.7 and 7.9 minutes, respectively, but these were not compared statistically. In Ridsdale, audiotape was also used to estimate length. Mean duration of consultations in 5, 10 and 15 minute appointments were 6.6, 8.0 and 9.2 minutes, respectively, with no overlap of 95% confidence interval (CI) around these estimates. In Wilson, consultation length was

assessed by observation and rounded to the nearest minute. Median (mean) duration was 7 (8.25) minutes in 10 minute appointments and 6 (7.16) minutes in the control group (*P*<0.001 Mann–Whitney test). In all trials the difference in consultation length was less than the change in appointment length, particularly when appointment length was extended.

Recording of problems, referral investigation and prescribing and reconsultation rates. Morrell found the percentage of consultations with more than one problem recorded was greater as appointment length increased but neither Ridsdale nor Wilson found a statistically significant difference. Two trials looked at the percentage of consultations in which a psychological problem was recorded. In neither was there a consistent difference (Table 3).

Neither of the two trials assessing the percentage of consultations resulting in specialist referrals found a statistical difference. Similarly the two trials assessing percentage of consultations resulting in one or more investigation found these were not statistically significant. The percentage of consultations including a prescription was examined in three trials but none found any consistent relationship. Two trials examined antibiotic prescribing. In Morrell these were more likely to be prescribed with shorter appointments and this was reported as not being accounted for the higher proportion of patient-initiated consultations with shorter appointments. However Ridsdale found no relationship.

None of the four trials reporting data on reconsultation found any consistent or statistically significant differences.

Examination. All three trials of altering appointment length assessed the percentage of consultations in which one or more physical examination took place (Table 4). In Morrell results are presented separately for patient and doctor-initiated consultations. In the

former more examinations took place with shorter appointments and in the latter more took place with longer appointments. The authors suggest some of these differences may be explained by case mix, with more acute illness present in shorter appointments. The other trials found no consistent relationship. Two of the three trials examining percentage of consultations in which blood pressure was recorded found that this occurred more frequently with longer appointments. The rate of vaginal examination for women aged over 16 years was assessed in two trials. In Morrell 1986 rates in 5, 7.5 and 10 minute appointments were 2, 10 and 10%, respectively, in patient-initiated consultations and 5, 11 and 7%, respectively, in doctor-initiated consultations (neither difference was tested statistically). Ridsdale found more vaginal examinations took place with longer appointments (3, 2 and 7% for 5, 10 and 15 minute appointments, respectively, odds ratio 2.9, 95% CI = 1.3 to 6.6).

Health promotion. Two trials assessed health promotion statements on audiotape (Table 5). In a second paper from Morrell's trial, Roland assessed the number of health education items mentioned by the doctor and calculated the percentage of consultations in which the number of items recorded was greater than the overall median. This increased from 14.5 in 5-minute appointments to 16.9 in 7.5-minute appointments and 22.1 in 10-minute appointments ($P<0.001$, χ^2 for trend).

Wilson analysed audiorecordings of a subsample of consultations and calculated the percentage of consultations in which discussion of a health promotion topic took place. This showed a non statistically significant increase, from 24.4% in control consultations to 28.4% in those booked at 10 minutes. This trial also examined the proportion of consultations in which a health promotion item was recorded in the medical record. This was 8.8% in control consultations and 15.5% in those booked at 10 minutes ($P<0.001$, χ^2 test). Wilson also used a patient questionnaire as a source of information about health promotion. The proportion of current smokers reporting advice was 19.8% in control consultations compared with 31.8% in those booked at 10 minutes ($P<0.001$, χ^2 test). However rates of reported advice about diet and alcohol differed little (rates of 11.3% and 11.4% and 5.0% and 7.0% with control and 10-minute appointments respectively).

Patient satisfaction

This was assessed in three trials but none used a validated instrument. Morrell showed a non-statistically significant trend in favour of longer appointments. Ridsdale used a similar 4-item questionnaire but included a question specifically about whether too little time was available. This showed a statistically significant trend favouring longer appointments for that item ($P<0.05$) but none of the differences in other item scores were statistically significant. Wilson used a 12-item satisfaction questionnaire and failed to detect any effects of appointment length (unpublished data).

Doctor stress

This was examined in two trials. In Morrell's trial,

Table 3. Recording of problems, referral investigation, prescribing and re-consultation rate.

Appointment length in minutes (number of patients included)	Consultation with >1 problem (%)	Consultation with psychological problem (%)	Referred to specialist (%)	Investigation (%)	Prescribing (%)	Re-consultation (%)
Morrell 1986	$P<0.01$[a]	P NS	P NS[a]	P NS[a]	P NS[a]	P NS[a]
5 (275)	11	9	8	9	59	16[b]
7.5 (262)	16	14	9	10	63	12
10 (243)	22	12	10	10	62	18
Ridsdale 1989	P NS[a]	P NS[a]			P NS[a]	P NS[a]
5 (348)	14	8	-	-	61	30[d]
10 (277)	19	8	-	-	63	29
15 (336)	14	5	-	-	58	31
Wilson 1992 (unpublished results in parentheses)	P NS[c]		P NS[c]	P NS[c]	P NS[c]	P NS[c]
6–7.5 (1496)	(32)	-	(5.0)	(8.8)	55.7	(42)[d]
10 (1461)	(35)	-	(5.7)	(10.6)	56.9	(46)
Thomas 1978						P NS[c]
Short consultation (100)						27[e]
Long consultation (100)						20

[a]χ^2 for trend. [b]Asked to book return consultation. [c]χ^2. [d]Re-consultation within 12 weeks. [e]Re-consultation within 4 weeks. NS = Not stated.

Table 4. Examinations.

Author	Doctor/patient initiated	Appointment length (mins)	Consultations n (%)	Any examination (%)	P	BP recorded	P	Vaginal examination (% female consultations)	P
Morrell 1986	Doctor	5	80	41		18		2	
	Doctor	7.5	117	55	<0.01[a]	27	NS	10	NS
	Doctor	10	114	63		29		10	
	Patient	5	195	77		7		5	
	Patient	7.5	145	76	NS	8	NS	11	NS
	Patient	10	129	69		12		7	
Ridsdale 1989		5	348	82		22		3	
		10	277	83	NS[a]	17	NS[a]	2	<0.05[a]
		15	336	83		16		7	
Wilson 1992		6	1496	65[b]	NS[c]	19	<0.001		
		10	1461	64[b]		24			

[a]χ^2 for trend. [b]Unpublished results. [c]χ^2. NS = Not stated.

doctors' heart rates were monitored throughout the consultation and a mean calculated. This showed no significant differences between different booking intervals. Doctors also completed a 5-item stress questionnaire at the beginning and end of each session. This also found no differences. Wilson included assessment of doctor stress and arousal before and after each consultation, using a validated mood adjective checklist. At the end of the 10-minute appointment session stress scores were significantly lower and arousal scores significantly higher than in control sessions ($P<0.001$).

Health status
No studies reported the effects of interventions to alter consultation length on patient health status.

Resources associated with the intervention and any consequent changes in clinical care
No studies reported resources associated with the intervention.

DISCUSSION
The number of eligible studies was small, and all had methodological weaknesses, particularly due to lack of randomisation and consequent questions about comparability of case mix. All were short-term and tested multiple hypotheses, for some of which they were underpowered. All were conducted in the UK within the same decade. The most evident finding is that several aspects of doctors' behaviour remained unchanged despite major changes in appointment length. In part this could be due to the relatively small changes in consultation length that were observed. Prescribing, referral, investigation and reconsultation/follow-up rates did not change. Recognition of multiple and psychological

problems did not increase with more time availability, and neither did the number of examinations performed, with the possible exception of blood pressure measurement. There is some evidence that doctors used greater time availability to discuss health promotion issues, especially cigarette smoking.

There was no evidence that changing to longer appointments led to greater patient satisfaction, and no work has been done on other short-term outcomes such as patient enablement. Results on doctors' stress are inconsistent. Potential effects of a more sustained change to longer consultations, for example on chronic disease control, have not been examined in intervention studies, nor has any study included an economic analysis.

Table 5. Health education/prevention.

Author	Appointment length (mins)	Eligible consultations n	Item present n (%)	P
Roland 1986	5	220	14.5[a]	
(detected on	7.5	213	16.9[a]	<0.001[b]
audiotape)	10	190	22.1[a]	
Wilson 1992	6	180	44 (24.4)	NS
(detected on	10	275	78 (28.4)	
audiotape)				
Extracted from	6	1432	126 (8.8)	<0.001[c]
medical record	10	1411	218 (15.5)	
Current smoker				
reporting advice[d]	6	212	42 (19.8)	<0.01[c]
	10	258	82 (31.8)	
Discussion of diet[d]	6	839	95 (11.3)	NS
	10	950	108 (11.4)	
Discussion of alcohol[d]	6	839	42 (5.0)	NS
	10	956	67 (7.0)	

[a]Percentage consultations in which number of health education statements greater than overall median percentage consultations with health education. [b]χ^2 for trend. [c]χ^2. [d]From patient questionnaire.

In summary, few of the differences found in observational studies have been replicated when an intervention was introduced to enable doctors to consult more slowly. One explanation for this is that doctors who consult more slowly are self-selecting, and so average consultation length is a marker of some other attribute, such as the patient centredness of the doctor, which is related to performance. Another is that the interventions evaluated, that is: short-term changes in appointment length in the absence of any clear objective, is insufficient to change behaviour. GPs are likely to become attuned to a particular style of consulting, including use of time, and so it is not surprising that they had difficulty either extending or truncating consultation length over a short period of time. Other studies have found that more focussed interventions, for example, to improve consultation skills, have resulted in more time being spent with patients.[15]

The findings of this review do not provide sufficient evidence to support or resist a policy of altering consultation lengths of primary care physicians. Future studies on the effects of altering time availability should be focussed on outcomes, and include a health economic analysis. They will need to be adequately powered and should aim to recruit a representative sample of doctors.

Accounting for clustering will have a substantial effect on sample size as the intraclass correlation coefficient is higher for interventions aimed at practitioners than those aimed at patients, and is typically 0.02.[16] This means that, for example, a study wanting to detect an increase in smoking advice from 20 to 30% with 100 patients per practice would need 18 practices, compared with six if clustering were ignored.

There is also a case for an extended trial of longer appointments, which could measure the intervention's effects on the whole system, including accessibility and availability of care, long-term effects on consultation rates and outcome measures such as patient enablement and control of chronic disease. Additionally there is a need to evaluate interventions offering longer consultations to selected patients, such as the elderly or those with complex medical conditions.

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