The feasibility and cost of a large multicentre audit of process and outcome of prostatectomy

Mark Emberton, David E Neal, Nick Black, Mark Harrison, Mark Fordham, Michael P McBrien, Robert E Williams, Klim McPherson, H Brendan Devlin

Abstract

Objective—To determine the feasibility of performing multicentre process and outcome audits of common interventions taking prostatic procedures as an example.

Design—Prospective, cohort study.

Setting—All National Health Service and independent hospitals in Northern, Wessex, Mersey, and South West Thames health regions.

Patients—5361 men undergoing prostatectomy identified by 103 of the 107 urologists and general surgeons performing prostatectomy in the study regions.

Main measures—Rates of participation by surgeons and patients; completeness of clinical data provided by surgeons; patient response rate and completeness of patient derived data; and cost.

Results—Most surgeons (103, 96%) agreed to participate. Overall, the proportion of eligible patients invited to take part was high (89%), although this was only measured in South West Thames, where dedicated data collectors were employed. Few men (80, 1.5%) declined to participate. Of those surviving for three months after surgery, 82.4% (4226) completed and returned the postal questionnaire. The response rate was higher in South West Thames (86.7%) than in the other regions (80.6%–80.8%). The audit was well received: 91% of patients found the questionnaire easy to complete and only 2.3% of them disapproved. Completeness of data was high with both the hospital and patient questionnaires. Missing data occurred in less than 5% of responses to most questions. The attributable cost was £34.50 per patient identified or £44 for patients in whom either the treatment outcome or vital status was known three months after their prostatectomy.

Conclusions—This multicentre audit of process and outcome of prostatectomy proved feasible in terms of surgeon participation, patient identification, and the quantity and quality of data collection. Whether the cost was warranted will depend on how surgeons use the audit data to modify their practice.

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Keywords: multicentre outcome audit, feasibility, cost, prostatectomy.

Introduction

With a growing body of research evidence on the effectiveness and appropriateness of prostatectomy,^{1–17} there is a need for a parallel development in auditing the use of the procedure. There is a limit to the value that individual surgeons can gain from auditing their own work in isolation. Much can be gained by comparison with other providers, but for this to be meaningful it is essential that both case mix and outcome are measured in the same way.^{18–20} Such comparative audit needs to be arranged on a large multicentre basis. However, the feasibility of such an undertaking is unknown. Will clinicians agree to participate? Can accurate and complete data be collected when numerous hospitals are included? And what resources are required both centrally and locally?

With this background, the Royal College of Surgeons of England, through its surgical epidemiology and audit unit carried out a multicentre audit of the structure, process, and patient perceived outcome of all prostatectomies performed in four health regions in both the public and private sectors over six months. The principal objectives were to determine the feasibility of performing a multicentre audit; to describe the extent of variations in clinical practice; to describe patients' perceptions of their symptoms and quality of life before and after surgery; to compare individual surgeons' performance in terms of patient selection, clinical management, and outcome; and to explore the factors associated with mortality, morbidity, and patient perceived outcome.

We report on the first objective in this paper. Feasibility was judged on the following criteria: the rates of participation by surgeons and patients; the completeness of the clinical data provided by surgeons; the impact of using data collectors; patients' response rate and the completeness of data provided by patients; and the cost of carrying out the audit.

Patients and methods

SURGEONS

All surgeons performing prostatic procedures in the 56 National Health Service (NHS) acute hospitals in Mersey (10), Wessex (11), Northern (17), and South West Thames regions (18) were contacted by letter. The invitation to participate came from the chairman of the steering group and was countersigned by the relevant regional co-ordinator. Failure to reply was followed up by the regional coordinator. One meeting was

**Surgical Audit Unit,
Royal College of
Surgeons of England,
London WC2A 3PN**
Mark Emberton, research
fellow
H Brendan Devlin,
director

**University of
Newcastle upon Tyne,
Newcastle upon Tyne**
David E Neal, professor
of surgery

**London School of
Hygiene and Tropical
Medicine,
London**
Nick Black, professor of
health services research
Klim McPherson,
professor of public health
epidemiology

**Royal Hampshire
County Hospital,
Winchester**
Mark Harrison,
consultant urologist

**Royal Liverpool
Hospital,
Liverpool**
Mark Fordham,
consultant urologist

**West Suffolk Hospital,
Bury St Edmunds**
Michael P McBrien,
consultant surgeon

**General Infirmary,
Leeds**
Robert E Williams,
consultant urologist

Correspondence to:
Mr Emberton

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held in each of the regions to explain the aim and objectives of the audit.

STUDY DESIGN

Data collection took place from 1 June to 30 November 1992 except in South West Thames, where collection occurred between September 1992 and February 1993. Recruitment of patients undergoing a prostatic procedure occurred at the time of surgery. The patient recruitment rate was assessed in South West Thames by visiting all hospitals (NHS and private sector) and comparing returns with theatre records.

A local data coordinator was appointed at each hospital site. This person was responsible for collecting the hospital questionnaires (see below) containing the patients' demographic and clinical data. The data coordinators were either audit assistants (91%) or medical secretaries (9%). Participating surgeons were asked to complete questionnaires on men who had undergone a prostatic operation while under their nominal care, irrespective of who was the principal operator.

The hospital questionnaires were returned in prepaid envelopes to the surgical audit unit. On receipt, an identifying number was sequentially allocated to guarantee continued confidentiality. Demographic data were entered on to a secure database (Q and A, Symantec) with the unique number as sole identifier. Thus any written link between demographic and clinical data was destroyed.

The local data coordinator ensured that every patient received a printed sheet after his operation that explained the nature of the study and invited participation. Three months later a patient questionnaire was sent to the patient's home with a covering letter and prepaid return envelope addressed to the surgical audit unit. Non-responders were sent a reminder two weeks later and, if that had no effect, a second reminder was sent after a further four weeks.

All patients were flagged at the NHS Central Registry, and the surgical epidemiology and audit unit was informed of any deaths. In this way the true response rate to the patient questionnaire could be obtained.

DEVELOPMENT OF HOSPITAL QUESTIONNAIRE

The hospital questionnaire was designed using optical image scanning technology to permit fast, accurate, and confidential automated data entry through a sheet-fed scanner on to a computerised database.^{21 22} The principal operating surgeon was the person responsible for completing the questionnaire. As patients were recruited at the time of surgery, questions on the preoperative phase were completed retrospectively unlike postoperative data, which were collected prospectively. The variables in the hospital questionnaire included: mode and category of admission, preoperative investigations, physical health status as expressed by the American Society of Anaesthesiology (ASA) grade, operation and anaesthetic details, intraoperative and postoperative complications, and mode of discharge.

DEVELOPMENT OF PATIENT QUESTIONNAIRE

During February 1992, 30 consecutive patients who had undergone prostatectomy three months previously were interviewed about their major likes and dislikes with respect to their recent hospital stay. Patients were then asked to complete a draft questionnaire which contained questions on symptoms, impact on lifestyle, sexual function, type and utility of information received, and satisfaction with care. Finally, we assessed the degree to which the questionnaire covered views and concerns about the hospital, the experience of the operation, and the outcome. The mean interview time was 42 minutes (range 30–95 minutes).

A pilot questionnaire was then formulated which included the American Urological Associations symptom index^{23 24} and an index of symptom bother which assessed how troublesome the symptoms were thought to be. Additional questions addressed both disease specific and generic quality of life^{25 26}; sexual function (seven questions); information offered to patients before and after admission to hospital (10 questions); and the experience of the patient after discharge in terms of complications, visits to their general practitioner, and hospital readmissions. Finally, patients were given the opportunity to write freely about their overall experience.

ESTIMATION OF COST OF AUDIT

An estimation of the cost of the audit included the time consultant surgeons and trainees devoted to completing the questionnaire (estimated to take 15 minutes); the cost of coordination, analysis, and reporting carried out by the research fellow (ME); the cost of consumables, in particular for printing and posting questionnaires, for flagging patient records at the NHS Central Registry, and for equipment costs. Fixed overhead costs of the buildings were not accounted for as these were deemed to be negligible.

STATISTICAL ANALYSIS

The participation rates of surgeons and patients were calculated. The impact of dedicated data collectors in South West Thames region was explored by comparison of rates with other regions. The completeness of data derived from the two questionnaires was described for each question. Association between patient demographic characteristics and both the amount of difficulty experienced completing the questionnaire and the amount/number of missing data were examined. Analyses of proportions were tested with the χ^2 statistic. The comparison of means in relation to sociodemographic characteristics and missing values was performed using one way analysis of variance. Missing values in excess of 5% were declared. Calculations were performed on valid cases only (responses).

Results

PARTICIPATION RATES BY SURGEONS

One hundred and ten surgeons were identified in the four regions (Wessex, 24; Mersey, 25; Northern, 29; South West Thames, 32). Three

surgeons chose not to take part: one said he was too busy; another would only participate if local funding was made available; and a third was approaching retirement. Six surgeons who agreed to take part subsequently failed to submit any patients. Of these, only one had performed any prostatectomies. Thus, of the 107 surgeons performing prostatectomy, 103 (96%) were successfully recruited into the study. Two consultants retired during the audit and their successors agreed to take part.

There was a wide range of surgeons in terms of the numbers of men they operated on each year. During the six month period the mean number recruited to the audit was 51.3 (range 1–182). Twelve surgeons submitted fewer than 10 cases during the study period; in contrast, 28 submitted more than 75 cases. Most operations were performed by specialist (1516; 29.8%) or generalist urological firms (2227; 43.7%). General surgeons accounted for only 934 (18%) cases, in which 787 operations were performed by surgeons with a predominantly urological workload. The regions were similar in terms of the proportions of patients operated on by surgeons with different degrees of specialisation.

RECRUITMENT OF PATIENTS

The proportion of eligible patients recruited was assessed in South West Thames region, where it was 89.4%. Three quarters of surgeons invited over 90% of their patients to participate (fig). Although recruitment was not studied in the three other regions, any consultant firm identifying fewer than 10 patients during the study period was asked to confirm their operating record during the study. Overall, 5361 men were invited to participate, of whom 5281 (98.5%) agreed and 80 refused (table 1).

PATIENT RESPONSE

Patient questionnaires were sent to all 5281 men agreeing to participate unless it was known that the man had died. In all, 103 (2%) of the dispatched questionnaires were returned by the post office as incorrectly addressed or because the occupant had moved. Table 1 shows the number of completed questionnaires returned (4226 (82.4%)). A further 153

questionnaires were returned unanswered, most often because of infirmity or poor memory. When these and the number of questionnaires returned by the post office were taken into account the response rate by men who received their questionnaire and were fit enough to complete it was 87%.

Rates of return for completed patient questionnaires were similar in regions using the same method of data collection: Wessex (80.6%), Mersey (80.8%), and Northern (80.1%). In contrast, South West Thames, which had two full time dedicated data collectors during the period of the study, achieved a significantly higher return rate of 86.7% ($\chi^2 = 37.4$, $p < 0.001$).

COMPLETENESS OF HOSPITAL QUESTIONNAIRES

No two hospitals collected data in quite the same way – complex methods that worked efficiently in one hospital were not applicable elsewhere. In 4981 out of 5094 (97.8%) cases the patient's hospital notes were available to the doctor completing the questionnaire (it was unknown whether the notes were available for the other 321 cases). Consultants completed questionnaires for 2733 (53.7%) cases, the remainder being done by senior registrars (619; 12.2%), registrars (492; 9.7%), and senior house officers or house officers (879; 17.3%). The proportion of questionnaires which were completed by a consultant varied between health regions from 42.5% to 70.7% ($\chi^2 = 182.9$, $p = 0.0001$). Only 235 (5%) respondents reported any difficulty in completing the questionnaire.

The proportion of missing answers to a particular question was low for most questions (0.8%–2.6%). Those missed in more than 5% of questionnaires were: whether the patient was treated under the NHS or privately, 8.6%; duration of operation, 9.6%; whether the patient was admitted to an intensive care unit, 8%; and anticipated outcome (surgeon defined), 5.7%.

COMPLETENESS OF PATIENT QUESTIONNAIRES

In the month before the operation, 514 (13%) men had a catheter in place and therefore did not complete questions contributing to the preoperative American Urological Association's symptom and bother indices. Similarly, 86 (2.1%) men who had a catheter in place during the third postoperative month were not asked to report their postoperative symptoms.

Table 2 summarises the proportions of missing answers for each subject included. The only subjects in the preoperative phase in which more than 5% of respondents failed to answer were presence of a urinary catheter (7.9%), activity impairment (5.4%–6.4%), and psychological impairment (5.2%–5.7%). The utility of information received, decision making and quality of information during admission all had missing answers greater than 5%. Answers to questions about postoperative health were more complete – the exceptions were questions addressing sexual function, in particular the question asking about change in ejaculatory characteristics (32%).

Proportions of patients from 23 provider units in South West Thames region invited to participate (89.4% of operations were identified)

Table 1 Summary table showing identification, recruitment, and response rate of patients for participating regions and overall

Region	No of consultant firms identified	No that recruited patients	No of patients invited to participate	No agreeing to participate	No (%) surviving three months	No (%) of completed patient questionnaires
Wessex	24	23	1749	1714	1673(97.6)	1348(80.6)
Mersey	24	19	767	758	731(96.4)	591(80.8)
Northern	30	27	1104	1070	1040(97.2)	833(80.1)
South West Thames	32	32	1552	1552	1505(97.0)	1305(86.7)
Subtotal	110	101	5172	5094	4949(97.2)	4077(82.1)
Trent*	2	2	189	187	182(97.3)	149(81.9)
Total	112	103	5361	5281(100)	5131(97.1)	4226(82.4)

*One hospital in Trent acted as a site for testing validity and reliability of data collection.

Half the respondents took the opportunity to provide free text information on any difficulties they had answering the questionnaire. Table 3 indicates that patients most frequently cited the questions on preoperative

and postoperative sexual function as most difficult.

Most men (3776(89%)) found the questionnaire either "very easy" (41%) or "quite easy" (48%) to complete. With advancing age, the proportion of men expressing difficulty increased: 6% of men under 65 expressed difficulty in contrast to 12% of men over 75 ($\chi^2 = 63.6$, $p = 0.0001$). Age of leaving full time education was not associated with difficulty in completing the questionnaire, but it was related to the patients' expressed approval of postal surveys of this type ($\chi^2 = 43.3$, $p < 0.0001$). Socioeconomic class, defined by last full time employment, was associated both with men's understanding ($\chi^2 = 32.1$, $p = 0.0001$) and acceptance of the questionnaire ($\chi^2 = 78.1$, $p < 0.0001$) (table 4).

Given that patients' perception of both difficulty and acceptability of the questionnaire was dependent on some sociodemographic variables, it was necessary to see whether the same variables were associated, in terms of degree and direction, with the quality of response. The missing values (mean) from the constituent questions to the preoperative American Urological Association's symptom index score (seven questions, each with six values) were calculated (table 5). Younger age, lower social class, and a shorter period of full time education were associated with significantly more missing values for the constituent questions, but the differences were small. Men who lived alone (and thus less likely to receive help with the questionnaire) did not differ significantly from those who cohabited. As almost all (99%) respondents were white it was impossible to comment on the effect of ethnic group on completion of the questionnaire.

ESTIMATION OF COSTS

The direct costs of the audit are shown in table 6. The principal expenditure was on project and clinical staff time. The cost of the study per patient identified ($n = 5361$) was £34.50 and per patient in whom outcome data were available ($n = 4226$) was £44.00. The cost of obtaining information on the vital status of non-responders ($n = 955$) through the NHS registry was £26 000, or £27.00 per patient.

Discussion

The feasibility of auditing the outcome of a common surgical procedure was determined in

Table 2 Proportions of missing responses by type of question in patient questionnaire

Subject	No of questions on subject	No (%) of respondents with no answer
<i>Preoperative phase (recollected)</i>		
Presence of catheter (month before operation)	1	335(7.9)
Preoperative symptoms (AUA index)	7	43(1.3) to 104(3.1)
Incontinence	1	42(1.2)
Symptom impact (level of bother)	7	106(3.1) to 112(3.3)
Disease specific impairment	3	156(3.7) to 176(4.2)
Global impairment	3	151(3.6) to 168(4.0)
Global satisfaction	1	167(4.0)
Activity impairment	3	230(5.4) to 270(6.4)
Psychological impairment	4	221(5.2) to 239(5.7)
Physical functioning	3	158(3.7) to 193(4.6)
<i>Information</i>		
Informed persistent symptoms	1	103(2.4)
Informed retrograde ejaculation	1	155(3.7)
Information utility	3	234(5.5) to 298(7.0)
Decision to undergo surgery	1	233(5.5)
Global information quality	1	225(5.3)
<i>Postoperative phase (contemporaneous)</i>		
Presence of catheter	1	188(4.4)
Postoperative symptoms (AUA index)	7	50(1.3) to 83(2.1)
Incontinence	1	50(1.3)
Symptom impact (level of bother)	7	124(3.1) to 138(3.5)
Disease specific impairment	3	142(3.4) to 148(3.5)
Global impairment	3	135(3.2) to 147(3.5)
Global satisfaction	1	116(2.7)
Activity impairment	3	111(2.6) to 177(4.2)
Psychological impairment	4	132(3.1) to 146(3.5)
Physical functioning	3	139(3.3) to 142(3.4)
<i>Complications after discharge</i>		
Disease specific complications	6	98(2.3) to 114(2.7)
<i>Sexual impairment</i>		
Sexual activity before and after operation	2	281(6.6) to 293(6.9)
Ejaculatory characteristics	4	657(15.5) to 1354(32)
Worry attributed to impairment	1	554(12.9)
<i>Sociodemographic characteristics</i>		
Cohabitation	1	84(2)
Completion full time education	1	146(3.5)
Age by half decade	1	66(1.6)
Social class by employment	1	330(7.8)
Ethnic origin	1	90(2.1)
Ease of questionnaire completion	1	105(2.5)
Satisfaction with study participation	1	94(2.2)

AUA = American Urological Association.

Table 3 Patients' reported difficulty in free text responses in answering particular questions in patient questionnaire*

Declared difficulty with questions	No of patients	Proportion (%) of responders ($n = 4226$)	Proportion (%) by type of question ($n = 1070$)
Questions on sexual function	486	11.5	45.4
Several question types	147	3.5	13.7
Concept of bladder fullness	131	3.1	12.2
Recollection of pre-operative status	87	2.1	8.1
Questions on information	85	2.0	7.9
Quality of life questions	69	1.6	6.4
Postoperative complications	65	1.5	6.1

*Overall, 911 patients made 1070 relevant comments on difficulty with questions.

Table 4 Patients' views of patient questionnaire by social class. Values are numbers (percentages) of patients

	Social class by last full time employment				Total
	Not specified	A/B	C1/C2	D/E	
Ease of completion?					
Very easy	109(32.7)	436(47.4)	927(41.9)	263(34.6)	1735(41.1)
Quite easy	128(38.4)	417(45.4)	1088(49.2)	408(53.6)	2041(48.3)
Quite difficult	17(5.1)	56(6.1)	147(6.6)	64(8.4)	284(6.7)
Very difficult	11(3.3)	4(0.4)	25(1.1)	17(2.2)	57(1.3)
Missing values	68(20.4)	6(0.7)	26(1.2)	9(1.2)	109(2.6)
Total	333(100.0)	919(100.0)	2213(100.0)	761(100.0)	4226(100.0)
Approval or not?					
Strongly approve	94(28.2)	366(39.8)	707(31.9)	222(29.2)	1389(32.9)
Approve	67(20.1)	329(35.8)	709(32.0)	208(27.3)	1313(31.1)
Do not mind	98(29.4)	213(23.2)	747(33.8)	306(40.2)	1364(32.3)
Disapprove	6(1.8)	4(0.4)	22(1.0)	19(2.5)	51(1.2)
Strongly disapprove	1(0.3)	1(0.1)	8(0.4)	1(0.1)	11(0.3)
Missing values	67(20.1)	6(0.7)	20(0.9)	5(0.7)	98(2.3)
Total	333(100.0)	919(100.0)	2213(100.0)	761(100.0)	4226(100.0)

terms of the likelihood of a surgeon's participation; the patient recruitment rate; the patient response in terms of both rate and completeness; and, finally, in terms of cost per patient. In summary, 96% of eligible surgeons identified 89% of eligible patients, who, if still alive at three months, returned 82% of the postal questionnaires. Overall, the questionnaires lacked about 5% of the requested data.

One of the most reassuring findings was that most surgeons agreed to take part. Although peer pressure was undoubtedly influential – the national prostatectomy audit was introduced at regional audit meetings which required the presence of all surgeons and the invitation to participate was from the Royal College of Surgeons of England – this was not the only factor. The prospect of having the results of their surgical firm compared with those of their peers was, we believe, sufficient incentive. The

Table 5 Sociodemographic factors associated with missing values for different groups of questions

Constituent questions to preoperative American Urological Association symptom index score		
	Sum of missing values (mean (95% confidence interval))	No (%) of valid cases*
Age by decade (ANOVA F ratio = 10.5, $p < 0.001$):		
<61	2.5(2.3 to 2.7)	332(9.8)
61–70	2.5(2.3 to 2.6)	1231(36.4)
71–80	2.1(2.0 to 2.2)	1344(39.7)
≥81	1.9(1.7 to 2.1)	475(14.0)
Total	2.2	3382(100.0)
Social class by last full time employment (ANOVA F ratio = 11.9, $p < 0.001$):		
A	1.8(1.4 to 2.1)	156(5.0)
B	1.9(1.7 to 2.0)	631(20.1)
C1	2.1(2.0 to 2.2)	834(26.6)
C2	2.4(2.3 to 2.6)	933(29.7)
D	2.7(2.5 to 2.9)	498(15.9)
E	2.6(2.1 to 3.0)	86(2.7)
Total	2.2	3138(100.0)
Age of finishing full time education (ANOVA F ratio = 11.6, $p < 0.001$):		
<16	2.3(2.2 to 2.4)	2534(76.7)
17–18	2.1(1.8 to 2.2)	375(11.3)
>19	1.8(1.6 to 1.9)	395(12.0)
Total	2.2	3304(100.0)
Home circumstances (Independent t test, $p = 0.5$):		
Living alone	2.2(–0.3 to 0.1)	548(16.4)
Cohabiting	2.3(–0.3 to 0.1)	2798(83.6)
Total	2.2	3346(100.0)

*Valid cases were patients who returned completed questionnaires ($n = 4226$) who had not had a catheter for the entire month before their operation ($n = 3733$). Differences in valid cases were accounted for by missing values within each independent variable.
ANOVA = Analysis of variance.

Table 6 Notional expenditure for items attributable directly to multicentre audit

Item*	Cost (£)
Manpower (including oncosts):	
Research fellow (24 months)	52 000
1 Assistant (part time)	23 000
2 Data collectors (12 months)	30 000
Hospital staff time	43 000
	148 000
Equipment:	
Computers (including support)	5 000
Software	2 500
Optical image scanning time	1 100
	8 600
Stationery and printing:	
Patient information leaflet (10 000) @ 0.06 each	600
Hospital questionnaires (7500) @ 0.35 each	2 625
Patient questionnaire (8 000) @ 0.42 each	3 360
Correspondence (reminders, etc)	2 600
Interim reports	1 500
Feedback report to surgeons	2 500
	13 185
Postage:	
Packs to participating centres	2 000
Outward mailshots	4 000
Prepaid returns	1 500
	7 500
Telephone calls and faxes	4 100
Regional meetings and travel	3 500
Total	184 785

*In addition £26 000 was spent on flagging all recruited patients to the NHS Central Registry in Southport.

result was that participating surgeons were able to compare the outcome of their workload both with each other and against pooled data in a format analogous to a confidential comparative audit in the knowledge that like was being compared with like.²⁷

Contrary to expectations at the start of the audit, participating surgeons identified a high proportion of patients. In the one region where this was actively pursued (South West Thames) 89% of eligible patients were identified. Although we have no way of knowing, patient recruitment may have been lower in the three other regions. In addition, it was not possible for us to be as confident about identifying accurate recruitment rates in the private sector as in the NHS. To a large extent recruitment in the private sector relied on surgeons reporting cases, whereas reporting in the NHS was invariably controlled by an independent person. Non-recruitment of eligible patients was not randomly distributed among surgeons. Most missed patients were attributable to a handful of surgeons, as most successfully recruited over 90% of eligible men.

Missing data in the hospital questionnaire were uncommon. This, together with the high rate of retrieval of hospital notes, contrasted sharply with some recent audits.²⁸ We believe three factors were important in this regard. Firstly, the design was prospective and the questionnaires were chronological in format. Secondly, the audit involved consultants from the start. Finally, audit assistants were closely involved in checking returned questionnaires.

We have shown that high patient response rates can be achieved on a large scale, especially if patients are solicited beforehand. We have also shown that the way the study was

conducted in the different regions was associated with different patient response rates. Regions that were administered in the same way had almost identical response rates (approximately 80%). In contrast, South West Thames obtained a higher response rate (87%), albeit at greater cost. This resulted from extra manpower in the form of two data collectors (only one data collector was responsible for the three remaining regions). Whether the cost required to boost the patient response rate was worth while remains unclear. The answer depends on whether the additional few percent differed systematically from the initial 80% who responded. Our analysis of late and non-response that has been published elsewhere suggests that this is not the case.²⁹ The response rate in South West Thames was close to that achieved in other smaller studies.^{30 31} This supports the notion that patients are eager to be given the opportunity to report the outcome of their surgery. Having done so, few patients found the questionnaire difficult. For most variables data were available from over 95% of respondents. The only subject with a high number of missing data was sexual function in general and ejaculatory characteristics in particular.

A study designed around a reliable point of patient identification (the operating theatre), brought with it problems in recording baseline preintervention health status. Patients therefore had to be asked to recall their preoperative health status some time after their operation. The relation between such retrospective recall and contemporary accounts are reported elsewhere.³²

Turning to cost estimates, we are not aware of any similar studies that have calculated cost per patient and therefore cannot compare our results with the cost of other audits. Certainly it compares favourably with pharmaceutical companies, which expect to pay investigators over £500 for identifying and completing data collection forms on one patient. In addition, as a proportion of the in-hospital cost of prostatectomy (about £1200) the £34.50 cost per patient represents 3% of the overall cost. Whether the cost is warranted will depend on how surgeons use the audit data to modify their practice³³ and thus enhance the benefit that patients receive from their treatment.

This paper has shown that large multicentre comparative audits are feasible without increasing the cost of care by more than a few per cent. These findings need to be replicated in other areas of health care before the results can be generalised. Such information should be available soon as similar multicentre audits have been and are being conducted by the Royal College of Surgeons of England.^{34 35}

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NORTHERN REGION

Mr T G Armitage (South Tyneside District Hospital), Mr P M Atkinson (Darlington Memorial Hospital), Mr R G Bentley (Hexham General Hospital), Mr P J English (Dryburn Hospital), Mr J G W Feggetter (Ashington Hospital), Mr E L Gilliland (North Tyneside General Hospital), Mr R R Hall (Freeman Hospital), Mr J R Hindmarsh (South Cleveland Hospital), Mr R Hole (South Cleveland Hospital), Mr F J Holmes (North Tyneside General Hospital), Mr I A Miller (Queen Elizabeth Hospital), Professor D E Neal (Freeman Hospital), Mr C Parker (Sunderland Royal Infirmary), Mr R Pollard (North Tyneside General Hospital), Mr P H Powell (Freeman Hospital, Newcastle), Mr P D Ramsden (Freeman Hospital, Newcastle), Mr J R Rhind (Hartlepool General Hospital), Mr D G Richards (West Cumberland Hospital), Mr C Roberts (Bishop Auckland General Hospital), Mr R R Roy (Sunderland Royal Infirmary), Mr W G Staff (Westmorland County Hospital), Mr R W Thomson (North Tyneside General Hospital), Mr R Y Wilson (Furness General Hospital), Mr Vadan (Queen Elizabeth Hospital), Mr R G Willis (Cumberland Infirmary), Ms J Whiteway (South Cleveland Hospital).

WESSEX REGION

Mr G F Abercrombie (St Mary's Hospital, Portsmouth), Mr F J Bramble (Bournemouth General Hospital), Mr C A Charlton (Royal United Hospital), Mr T J C Cooke (Salisbury General Hospital), Mr J Cumming (Southampton General Hospital), Mr P Donaldson (St Mary's Hospital, Isle of Wight), Mr M Harrison (Royal Hampshire County Hospital), Mr P J Jeffery (Weymouth and District Hospital), Mr J D Jenkins (Southampton General Hospital), Mr M G Johnson (Weymouth and District Hospital), Mr D B Mackie (Salisbury General Hospital), Mr G S McIntosh (Salisbury General Hospital), Mr D Meikle (Weymouth and District Hospital), Mr C U Moisey (Royal United Hospital, Bath), Mr B Morgans (Princess Alexandra Hospital), Mr J Iacovou (Princess Margaret Hospital, Swindon), Mr A B Richards (Basingstoke District Hospital), Mr J S Rundle (Bournemouth General Hospital), Mr C J Smart (Southampton General Hospital), Mr B H Walmsley (St Mary's Hospital, Portsmouth), Mr J Vinnicombe (St Mary's Hospital, Portsmouth), Mr T Walsh (St Mary's Hospital, Isle of Wight).

MERSEY REGION

Mr T Brightmore (Chester Royal Infirmary), Mr R Crosbie (Arrowe Park Hospital, Upton), Mr A Desmond (Broadgreen Hospital Trust, Liverpool), Mr J Elkington (Arrowe Park Hospital, Upton), Mr M Fordham (Broadgreen Hospital Trust, Liverpool), Mr G Foster (Chester Royal Infirmary), Mr M Heal (Leighton Hospital Trust, Crewe), Mr Holden (Macclesfield District General Hospital), Mr J Kane (Chester Royal Infirmary), Mr W Lloyd-Jones (Broadgreen Hospital Trust, Liverpool), Mr D Machin (Fazakerley Hospital, Liverpool), Mr J Massey (Whiston Hospital Trust, Prescot), Mr K Parsons (Royal Liverpool), Mr J E Pollet (Halton District General Hospital), Mr C Powell (Leighton Hospital Trust, Crewe), Mr J Shennan (Arrowe Park Hospital, Upton), Mr K Soir (Walton Hospital, Liverpool), Mr M Williamson (Fazakerley Hospital, Liverpool), Mr S Vesey (Southport and Formby District General Hospital), Mr K Woolfenden (Royal Liverpool University Hospital), Mr A Wu (Walton Hospital, Liverpool), Mr R Ewing (Halton District General Hospital).

TRENT REGION

Validation study: Mr J K Wightman, Miss R Styles (Chesterfield Royal Hospital).

SOUTH WEST THAMES REGION

Mr E C Ashby (Royal West Sussex Hospital, Chichester), Mr M J Bailey (Epsom Hospital), Mr R C Beard (Worthing Hospital), Mr P J R Boyd (St Helier Hospital, Carshalton), Mr P Britton (Royal West Sussex Hospital, Chichester), Mr J Bull (Crawley Hospital), Mr C R Charig (Epsom Hospital), Mr R S Cole (St Peter's Hospital, Chertsey), Mr J Davenport (St Peter's Hospital, Chertsey), Mr G Das (Mayday Hospital, Thornton Heath), Mr J A Dick (Kingston Hospital), Mr B W Ellis (Ashford Hospital), Mr S Ghazali (Queen Mary's Hospital, Roehampton), Mr E Gordon (St George's Hospital, London), Mr H Hills (St Peter's Hospital, Chertsey), Mr N G Hopkins (Crawley Hospital), Mr M C Jennings (East Surrey Hospital, Redhill), Mr C Jones (St Helier Hospital, Carshalton), Mr M Lavelle (Princess Royal Hospital, Haywards Heath), Mr J Maynard (Princess Royal Hospital, Haywards Heath), Mr R G Notley (Royal Surrey Hospital), Mr E Palfrey (Frimley Park Hospital), Mr D C Parr (Worthing Hospital), Mr T G Rao (St Peter's Hospital, Chertsey), Mr P Riddle (Parkside Hospital, Wimbledon), Mr Rogers (New Victoria Hospital, Kingston-Upon-Thames), Mr M Royle (Princess Royal Hospital, Haywards Heath), Mr F A W Schweitzer (Royal Surrey Hospital, Guildford), Mr R A P Scott (Royal West Sussex Hospital, Chichester), Mr R D C Southcott (Mayday Hospital, Thornton Heath), Mr B Ujam (Mayday Hospital, Thornton Heath), Mr C J Woodhouse (St George's Hospital, London), Mr Yates-Bell (Ashstead Hospital).

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Reynolds (Freeman Hospital, Newcastle), Ms Ann O'Kane, Ms Anne Wallace (Ashington Hospital), Amanda McGough, Ms Maureen Lonsdale (North Tees General Hospital), Ms Jennifer Donoghue (South Cleveland Hospital), Ms Joyce Hayes (North Tyneside General Hospital), Ms Pauline Blakey (Queen Elizabeth Hospital), Karen Ramsey (Sunderland Royal Infirmary), Ms Joyce Roycroft (North Tyneside General Hospital), Ms Beryl Percival, Ms Christine Evans (Hartlepool General Hospital), Ms Carol Elliott (West Cumberland Hospital), Mr Phillip Whitfield (Bishop Auckland General Hospital), Ms Pam Hackney (Westmorland County Hospital), Ms Karen Brown (Furness General Hospital), Mr Ralph Messersmith (Cumberland Infirmary).

WESSEX REGION

Ms Jane Dawson, Mr Steve Chiverton (St Mary's Hospital, Portsmouth), Ms Karen Hatchard (Bournemouth General Hospital), Ms Audrey Beaver (Royal United Hospital, Bath), Ms Virginia Taylor, Ms Hilary Mace (Salisbury General Hospital), Ms Sue Lydeard (Southampton University Hospitals NHS Trust), Ms Julie Allsop (St Mary's Hospital, Isle of Wight), Ms Angela Flavell (Royal Hampshire County Hospital, Winchester), Ms Cecilia Wiseman (Southampton General Hospital), Weymouth and District Medical Audit Department, ward clerks and secretaries, Mrs Shepardson (Princess Alexandra Hospital), Ms Jenny Rendell, Ms Hilda Cooper (Princess Margaret Hospital), Ms Valerie Sloat (Basingstoke District Hospital).

MERSEY REGION

Mr Bancroft Grasey (Chester Royal Infirmary), Ms Diane Williams (Arrowe Park Hospital, Upton), Mr D Irvine, Ms Lynn Preece (Broadgreen Hospital Trust, Liverpool), Ms Judith Newell (Leighton Hospital Trust), Ms Susan Hughes (Macclesfield District General Hospital), Ms Sandra Corfe, Mr Stephen Mangen (Fazakerley Hospital, Liverpool), Ms Sandra Bryan, Ms Stephanie Arno (Whiston Hospital Trust, Prescot), Ms Sue Horton (Royal Liverpool University Hospital), Mrs Ruth Cooney (Halton District General Hospital), Mrs A M Masterson (Walton Hospital, Liverpool), Ms Jill Kirk (Southport and Formby District General Hospital).

SOUTH WEST THAMES REGION

Mrs Anne Fish and Mrs Margaret Pyle (Royal Surrey County Hospital, Guildford). Validation study addressing capture rates.

TRENT

Mr Andy Challands, Ms Joan Smith (Chesterfield Royal Hospital). Validation study addressing contemporaneous versus recollected symptom capture.

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