

A systematic review of the effect of primary care-based service innovations on quality and patterns of referral to specialist secondary care

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SUMMARY

Background: Innovations are proliferating at the primary-secondary care interface, affecting referral to secondary care and resource use. Evidence about the range of effects and implications for the healthcare system of different types of innovation have not previously been summarised.

Aim: To review the available evidence on initiatives affecting primary care referral to specialist secondary care.

Setting: Studies of primary-secondary care interface.

Method: Systematic review of trials, using adapted Cochrane Collaboration (effective practice and organisation of care) criteria. Studies from 1980 to 2001 were identified from a wide range of sources. Strict inclusion criteria were applied, and relevant clinical, service and cost data extracted using an agreed protocol. The main outcome measures were referral rates to specialist secondary care.

Results: Of the 139 studies initially identified, 34 met the review criteria. An updated search added a further 10 studies. Two studies provided economic analysis only. Referral was not the primary outcome of interest in the majority of included studies. Professional interventions generally had an impact on referral rates consistent with the intended change in clinician behaviour. Similarly, specialist 'outreach' or other primary care-based specialist provider schemes had at least a small effect upon referral rates to secondary care with the direction of effect being that intended or rational from a clinical and sociological perspective. Of the financial interventions, one was aimed primarily at changing the numbers or proportion of referrals from primary to specialist secondary care, and the direction of change was as expected in all cases. The quality of the reporting of the economic components of the 14 studies giving economic data was poor in many cases. When grouped by intervention type, no overall pattern of change in referral costs or total costs emerged.

Conclusion: The studies identified were extremely diverse in methodology, clinical subject, organisational form, and quality of evidence. The number of good quality evaluations of innovative schemes to enhance the existing capacity of primary care was small, but increasing. Well-evaluated service initiatives in this area should be supported. Organisational innovations in the structure of service provision need not increase total costs to the National Health Service (NHS), even though costs associated with referral may increase. This review provides limited, partial, and conditional support for current primary care-oriented NHS policy developments in the United Kingdom.

Keywords: referral and consultation; primary care; health care delivery; health services needs and demands; review.

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Introduction

THERE have been a considerable number of initiatives either to improve the care of patients in primary care (including referral to secondary care), or to provide a greater range of services within primary care in the United Kingdom (UK). Such initiatives raise concerns about the balance between primary and secondary care, since some may encourage referral to secondary outpatient care, while others may discourage referral.¹⁻³ However, few studies have measured the direct or indirect effect of these innovations on referral to specialist secondary care. Assessment is not straightforward because both increases and decreases in numbers of referrals may be beneficial to patients and it is necessary to take into account quality of care, patient acceptability, and health outcomes. In order to provide information for the organisers of health care, and for those considering developing or adopting initiatives, we undertook a commissioned systematic review to describe the range of initiatives affecting, or implemented in, primary care that influence referral in the UK National Health Service (NHS). We report on the nature and size of the effects of these initiatives on referrals and identify, where possible, those that are likely to enhance primary care.⁴

Method

We used guidance on systematic review methods from the Cochrane Collaboration⁵ and the NHS Centre for Reviews and Dissemination⁶ to guide our strategy for identifying and appraising the quality of studies.

Search strategy

Database searches (using a mixture of subject-heading and full-text searches) of Medline, EMBASE and ASSIA were conducted for English language material from 1985 to 1999, or from 1980 if initial searches suggested relevant studies. The search was updated using the most fruitful databases during 2001.

Completed and ongoing projects in the UK were also identified from the NHS National Research Register, the MRC's (Medical Research Council's) Health Services and Public Health Research Board Programme, and the Health Management Information Compendium (HMIC).

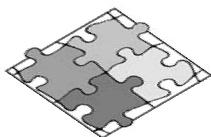
Cochrane Collaboration sources (The Cochrane Library and the Effective Practice and Organisation of Care [EPOC] specialised register) and the databases of the NHS Centre for Reviews and Dissemination (Database of Abstracts of Reviews of Effects) were searched for existing reviews, and

HOW THIS FITS IN*What do we know?*

Referral rates vary across primary care providers and fluctuate for a variety of reasons. Referral rates to specialist secondary care vary across clinical areas.

What does this paper add?

Professional interventions (guidelines, education) affect clinical behaviour but have a less strong impact on referral rates to specialist secondary care; most planned organisational innovations affect referral rates; no pattern of impact on the total costs of care can be established.

**Inclusion criteria**

The written inclusion criteria for subject relevance were:

1. 'an intervention of any sort in the general practice setting and/or system'
2. 'having a measured effect upon referral to specialist care (in the secondary care setting)'

The 'general practice system' was taken to include changes at the primary–secondary care interface, such as open-access schemes, that had a direct bearing upon the referral process to the secondary care setting. We included studies in healthcare systems where referral to a secondary care specialist, usually by a 'general practitioner', was the key focus, in order to give maximum generalisability to the National Health Service, who commissioned the study.

Search strategy

For database searching (EMBASE in this example), the term 'Referral' was combined with a set of terms covering 'general practice' and 'primary care', and these in turn were combined with a set of terms denoting (and including) 'intervention' and 'innovation' such as 'program\$', 'scheme\$' and 'project\$'. Combined search terms were sought in titles, abstracts and index headings in the relevant databases.

Box 1. Inclusion criteria and search strategy.

judgements were made as to subject relevance. A separate review of guideline implementation studies was included.⁷ Retrieved reference lists from published studies and relevant reviews were hand searched for further studies.

Management of bibliographic data

All studies were entered into a database using 'Reference Manager' software. Keywords were used to describe the 'intervention type', in accordance with the EPOC guidelines.⁸ These describe practice interventions as either organisational, structural, professional, financial, regulatory, or patient-oriented.

Selection and appraisal of studies

Studies that met the subject criteria were appraised for methodological quality using the EPOC guidelines⁸ (see Box 1). These criteria classify acceptable studies into one of four categories: randomised controlled trials (RCTs), controlled clinical trials, controlled before–after studies, or interrupted time series (i.e. before–after without controls). Each study type was evaluated against up to 11 separate methodological criteria. Two amendments were made to the

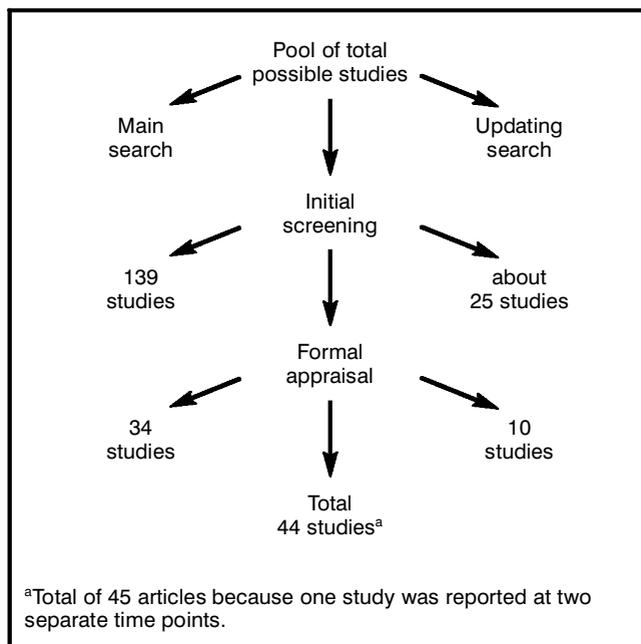


Figure 1. Flow chart of study search and selection.

EPOC criteria. First, we created an additional study design, 'observational controlled study'. For this, we adapted the criteria for controlled before–after studies with the stipulation that data collection for the compared settings or groups should have been simultaneous. Second, we relaxed the key criteria for interrupted time series (ITS) studies so that one data point before and two points after intervention were considered sufficient (instead of three before and three after).

The appraisal checklists included either two or four 'key' criteria (A, B or A, B, C, D depending on study design) that acted as quality 'cut-offs' for inclusion in the review. The minimum inclusion criteria across all study designs were that there was 'objective measurement of performance/provider behaviour of health/patient outcomes in a clinical not test situation' and that 'relevant and interpretable data were present or obtainable'. If these key criteria were not met, the study was excluded (see Figure 1). All criteria are shown in the appraisal tables (Supplementary appendix 1) and defined in the EPOC data collection checklists.⁸ The reviewers underwent training in the application of the checklist criteria by independently reviewing four papers that were then discussed at team meetings. Subsequently, two reviewers independently assessed each study. When disagreements occurred, they were resolved by discussion or by obtaining a third opinion. For every study appraised, it was noted whether any cost data or economic analyses were included. Scoring was not used.⁹

Data extraction

For the selected studies, data were extracted by one reviewer and checked by a second. Economic data were also extracted and presented separately (Supplementary appendix 2).

The data extraction tables (Supplementary appendix 3) were intended to convey the heterogeneity of the studies, while at the same time allowing comparisons to be made across studies of similar design and/or topic, and enabling

the most valid and powerful studies to be highlighted. The range of measures employed in each reviewed study was described, and data extracted for referral outcomes and one other researcher-defined primary outcome variable (where referral effects were not the primary outcome measure). Other outcome measures were listed in the data tables. Thus, in some studies, clinical outcomes, organisational effects, and patient or professional acceptability were included.

Some reviewed studies presented analyses without tests of statistical significance or calculation of confidence intervals to interpret the strength of estimates of effects and/or differences between groups. Where possible, the reviewers performed these additional calculations. Size of effect, where reported, has been classified as 'small' (<5%), 'moderate' (5–10%), or 'large' (>10%) and the width of confidence intervals has been classified as narrow, moderate, or wide using the reviewers' judgement, bearing in mind the above classification for size of effect.

Results

Search and retrieval

The initial search and filtering process identified 139 primary research studies and 21 reviews of potential relevance, for which the full text of the report or article was obtained. It was notable that the number of relevant titles and abstracts increased greatly with time over the initial search period (1980 or 1985 to 1999). The updating search during 2001 yielded a further small set of studies. Overall, the highest yielding source was EMBASE.

Selection

Application of the subject relevance criteria and the key methodological criteria initially resulted in the exclusion of 104 primary research studies (Supplementary appendix 4), leaving 35 reports (34 studies) for full appraisal and data extraction, including one with only economic analysis. The update in 2001 added a further nine primary studies and another one with only economic data, a total of 44 separate studies in 45 publications. These represented a very diverse range of clinical areas, and in about half, referral was not the primary outcome of interest. Included studies with referral data comprised: 20 randomised controlled trials,^{10,11,14,16,18,19,21,24-26,29,30,31,37,40,41,47-49,54} six controlled before-after studies (7 reports, because one study was reported separately at two time points),^{13,32,33,39,46,50,52} seven observational controlled studies,^{12,17,20,22,23,35,43} nine interrupted time series designs,^{27,28,34,36,38,44,50,51,53} and two economic appraisals^{14,42} (Table 1). The intervention categories were: professional interventions (for example, clinical guidelines, $n = 16$); organisational (for example, open-access schemes, $n = 22$); financial and regulatory, (for example, general practice [GP] fundholding, $n = 6$); public/patient oriented, (for example, information campaign, $n = 4$). Some studies were classified in more than one category. Twelve of the included clinical studies provided information on resource use or costs (see Table 1) and the economic analysis studies provided economic data only. Data on secondary care referral outcomes and aspects of study design for each of the studies were tabulated in full (Supplementary appendix 3).

Table 1. Summary of included studies classified by intervention type (Cochrane EPOC classification), study design and clinical area.

| Study design: first author, publication date ^a | Clinical area |
|---|--|
| Professional interventions in primary care^b | |
| Guidelines | |
| RCT: Emslie, 1993 | Management and referral of infertility |
| RCT: Oakeshott, 1994 | Referral for radiological investigation |
| RCT: Hobbs, 1996 | Hyperlipidaemia |
| RCT: Thomas, 1998 | Urology (benign prostatic hyperplasia) |
| RCT: Morrison, 1999 | Management and referral of infertility |
| RCT: Worrall, 1999 | Depression |
| Education/information | |
| RCT: Bennett, 2001 | Glue ear |
| RCT: Donohoe, 2000 | Diabetic foot care ^c |
| RCT: Kendrick, 1995 | Mental health |
| OC: Fender, 1999 | Menorrhagia |
| ITS: French, 1990 | Waiting list information |
| ITS: Nichols, 1984 | Breast cancer |
| ITS: Rutz, 1989 | Mental health (depression) |
| ITS: Whitehead, 1989 | Malignant melanoma |
| ITS: Wells, 1992 ^{d1} | Mental health (adolescent) |
| ITS: MacKie, 1992 | Malignant melanoma |
| Organisational interventions^d | |
| In-house: primary care provider | |
| RCT: Delaney, 2001 | <i>H. pylori</i> test (and open access) ^e |
| RCT: Jones, 1999 | <i>H. pylori</i> test and treatment ^e |
| RCT: Kinnersley, 1999 | Generic |
| RCT: Tucker, 1996 | Antenatal care |
| OC: Rink, 1993 | Near patient testing ^b |
| In-house: 'specialist' care provider | |
| RCT: Power, 1990 | Mental health (anxiety) |
| RCT: Hemmings, 1997 | Mental health (counselling) |
| RCT: Harvey, 1998 | Mental health (counselling) ^e |
| CBA/ITS: Tyrere, 1990 | Mental health (psychiatry) |
| CBA: Wells, 1992 ^{d2} | Mental health (community psychiatric nurse) |
| CBA: O'Cathain, 1995 | Physiotherapy |
| OC: McKechnie, 1981 | Mental health (multidisciplinary psychiatry) |
| OC: Hackett, 1993 | Physiotherapy ^c |
| OC: Gillam, 1995 | Ophthalmic ^c |
| OC: Blair, 1996 | Paediatrics ^c |
| GP fundholding | |
| CBA: Coulter, 1993 | Generic ^e |
| CBA: Surender, 1995 | Generic ^e |
| ITS: Howie, 1993 | Generic |
| ITS: Howie, 1994 | Generic ^c |
| Open-access schemes | |
| OC: Ellman, 1982 | Physiotherapy |
| RCT: Gentle, 1984 | Physiotherapy |
| ITS: Moayyedi, 1999 | <i>H. pylori</i> screening |
| RCT: Thomas, 1998 | Urology |
| Financial and regulatory interventions^f | |
| Financial | |
| CBA: Krasnick, 1990 | Remuneration system |
| CBA: Linnala, 2001 | Private sector referral subsidised to patients |
| ITS: Schoffski, 1997 | Drug budget ^e |
| Public/patient-oriented interventions^g | |
| Information | |
| RCT: Atherton-Naji, 2001 | Antidepressant drug use |
| ITS: MacKie, 1992 | Malignant melanoma |
| RCT: Thomson, 1999 | Babies' general health |
| ITS: Whitehead, 1989 | Malignant melanoma |
| Economic analysis only^h | |
| Delaney, 2000 | <i>H. pylori</i> testing (dyspepsia) |
| Ratcliffe, 1996 | Antenatal care |

^a $n = 45$ reports (44 studies). ^b16 studies. ^cEconomic data provided. ^d22 studies (23 reports). ^eCoulter and Surender report the same study at different time points. ^f3 studies and 3 GP fundholding studies. ^g4 studies. ^h2 studies. RCT = randomised controlled trial; OC = observational controlled; ITS = interrupted time series; CBA = controlled before-after.

Effects of interventions on referrals

Overall, we were able to include 44 studies with highly varied design, few of which were randomised trials, although the proportion increases in recent years. About half of the studies evaluated innovations explicitly intended to change referral rates (either increase or decrease). The quality of studies was generally quite poor; for example, no study published a sample size calculation and many lacked power, several failed to carry out appropriate statistical tests, and many did not present principal findings in a manner facilitating data extraction, although an improvement was noted in recent years, with, for example, the use of cluster randomisation in some cases. In these circumstances, and with the diversity of topics, a quantitative approach to summarisation was not possible and the studies were best summarised with a qualitative overview,⁶ classified by intervention types.

Professional interventions (n = 16). These demonstrate that education and/or guidelines generally result in some change in clinical behaviour. This may or may not be reflected in referral rates. Educational interventions can lead appropriately to general practitioners either referring more patients to specialists in secondary care; for example, after training, to undertake structured assessments of the long-term mentally ill,³⁰ or referring fewer patients; for example, after training in the management of menorrhagia.¹⁹ An interesting RCT showed a small (but statistically non-significant) compression of variation between general practices in referral rates for glue ear following a checklist-plus-video intervention.¹¹ Among the studies of guideline interventions (see Table 1), three of the six studies combined guidelines with other innovations, including an educational session (referral rate increase),⁵⁴ a structured management sheet (referral rate increase),¹⁸ and an open-access facility (improvement in quality, no effect on referral).⁴⁷ Of the others, two guideline-only studies showed probable improvements in quality criteria but no change in secondary referral,^{37,40} and a third, a study of computerised decision support, showed an appropriate reduction in referral, though in an underpowered study.²⁶ The sizes of effect were highly variable.

Organisational interventions (n = 22). This group encompassed general practice in-house primary healthcare team and specialist provider schemes, GP fundholding, and open-access referral schemes. Few good quality studies have examined in-house primary care provider schemes. One RCT showed a clear decrease in specialist secondary care referral rates associated with an in-house referral scheme,³¹ and another showed an increase associated with routine antenatal care provided by general practitioners and community midwives.⁴⁹ Three recent UK studies examined in-house *Helicobacter pylori* testing and management: two 12-month RCTs showed large increases in secondary referrals for endoscopy,^{15,29} whereas one 24-month interrupted time series study of screening showed a large reduction.³⁶

There were 10 studies of specialist 'outreach' or other primary care-based specialist provider schemes covering various clinical areas. All except one²³ demonstrated at least a small effect upon secondary referral rates attributable to the intervention, the direction of effect being that intended

or, in our judgment, rational from a clinical or sociological perspective. Three studies of specialist interventions in mental health showed robust evidence of reductions in referral rates^{41,50,52}; two studies of in-house counselling demonstrated a moderate or large reduction in secondary care referral rates, though with low and moderate precision, respectively^{24,25}; one study of in-house ophthalmology showed a moderate reduction in referral rates.²² However, the two studies of in-house physiotherapy were inconclusive when considered together.^{23,39}

Three studies of open-access schemes involved referrals to orthopaedics and/or rheumatology^{17,21} and urology.⁴⁷ Two of the studies had robust findings; one showed a clear decrease in referrals to consultant out-patient clinics as a result of the introduction of GP open-access physiotherapy,²¹ and the other showed no effect on urological referral of the introduction of open access to urological investigations.⁴⁷ A fourth study in this group was the interrupted time series study of an open-access *H. pylori* screening service, referred to above, which showed a robust and large reduction of referrals for endoscopy in secondary care.³⁶

Financial/regulatory (n = 6 studies in 7 reports). Four reports from three studies investigated the impact of UK fundholding^{13,46,27,28}; one study examined changes in remuneration to primary care physicians in Denmark and England³²; one examined the impact of a cost containment policy in Germany (included because of its clear evaluation of secondary specialist care referral)⁴⁵; and one examined subsidised referral to private specialists in Finland.³³ Although none of these, except the Finnish study, aimed primarily to change the number or proportion of referrals from primary to specialist state-provided secondary care, the direction of change was as expected in all cases and usually a decrease.

Patient/public interventions (n = 4). The number of studies in this category was notably small. Two studies of campaigns about malignant melanoma both showed large increases in secondary care referral.^{34,53} A study of antidepressant drug prescription compliance was underpowered,¹⁰ and educational material on general health for mothers of infants showed a small but non-significant effect on referral and other service use in an RCT.⁴⁸

Mental health (n = 11). It is notable that eleven studies related to mental health services. Four of these evaluated professional interventions and showed an effect on referral rates, but the clinical appropriateness is difficult to judge and generalisability is questionable.^{30,44,51,54} One randomised trial showed a robust effect of an educational intervention for long-term mentally ill patients, leading to increased secondary care referral,³⁰ and another also showed a large increase in referral but with less precision.⁵⁴ Of the organisational intervention studies, all demonstrated an apparent effect on referral rates to secondary care in the expected direction, with widely varying degrees of precision and sizes of effect. For example, there were reductions in referrals to secondary specialist care when counselling was provided in primary care²⁴ and increases when multidisciplinary specialist out-reach was provided.³⁵

Effects of interventions on costs

Comparing results across a diverse range of interventions and quality of studies was difficult (Supplementary appendix 3). The quality of the reporting of economic data was poor or unclear in many cases, with little consistency in the range of costs included. When grouped by intervention type, no overall pattern of change in the costs of referral or the total costs of care emerged. Two studies evaluating the introduction of guidelines showed that they were not cost effective over the time periods studied; this result is likely to be owing to the high initial costs of guideline development and short time periods of implementation and evaluation.^{37,47} Of the seven studies of organisational interventions, three showed a reduction in total costs,^{24,42,43} but total costs were impossible to assess in the other studies. Costs associated with referral increased in two of these studies.^{22,42} As noted, three recent studies considered initial endoscopy and/or testing for *H. pylori* in the management of dyspepsia.^{14,15,29} Two studies showed an increase in mean total costs to the NHS per patient over 12 months.^{14,15} (No separate referral data were given; Delaney *et al*¹⁵ showed no change in the number of outpatient appointments.) Jones *et al* showed a decrease in total costs (although some costs were not included in the analysis) but an increase in referrals.²⁹

Discussion

Innovations at the primary–secondary care interface were widely promoted during the 1990s, as was formal research to evaluate their effects. The search strategy for this review was wide-ranging and broadly defined in order to maximise its sensitivity. However, the number of good quality evaluations of innovative schemes to enhance the existing capacity of primary care and patient-oriented interventions, was small.

Studies of interventions in primary care that have an effect upon referral to the secondary care setting are extremely diverse in methodology, clinical subject, type of intervention and quality of evidence. This review suggests that professional interventions (typically education, information provision and/or guidelines) frequently affect clinical behaviour in a manner that is in accord with improvements in the process or quality of care. However, evidence for a consequent impact upon referral rates and patterns is less strong. Conversely, most of the studies of organisational and/or structural interventions did show an effect upon referral outcomes. In general, there was a suppression of referral to secondary outpatient care associated with a variety of in-house specialists.

Since the indexing of 'referral' as a term in electronic bibliographic sources is poor, and because the exact details of studies summarised in titles and abstracts of articles scanned during initial searching were sometimes obscure, it is possible that there may be some other relevant studies. Owing to the timing of the study it was not possible to include results of some ongoing studies included in the UK's NHS primary–secondary care interface research programme. Given the diversity of clinical areas represented, apparent differences in effects seen between professional and organisational interventions, and especially the finding that effect on referral was not the primary outcome in about

half the included studies, we believe that publication bias is unlikely to be a major influence.

The methodological quality of the studies reviewed varied widely, but was disappointingly low in general (although quality improved with some more recent studies using cluster randomisation techniques), making interpretation of the extracted and summarised results difficult. Of the 45 studies overall that met the inclusion criteria, there were a number of robust studies and studies showing clear effects, but there were also many whose statistical precision (confidence intervals for effect estimates) could not be gauged at all. This demonstrates the need for improvements in the quality of primary care research generally, and its presentation in particular.^{55,56} To have confined the review to studies in which referral outcomes were of primary interest would have greatly reduced the number of available studies. Studies from countries with healthcare funding and referral systems markedly different from the UK would have compromised generalisability to the NHS.

The project team found it necessary to adapt the EPOC criteria. We also found uncertainty in the interpretation of some of the criteria and, as a result, their application may have been a matter of judgement. In summarising the extracted data and to aid comparison between studies, the reviewers also exercised their judgement in describing the (point) estimates of effects and precision of studies — sizes of effect and confidence intervals — as small, moderate or large, and narrow, moderate and wide, respectively. These interpretations were aided by decision rules that were specified in advance, but inevitably contained a subjective element.

The evidence identified here suggests that a cautious approach should be taken to implementing innovations considered to improve health care at the primary–secondary interface. Local guidelines, open-access schemes and telemedicine have been proposed as offering benefits,⁵⁷ but there is little clear support that they would produce benefits in terms of the impact on referrals. Therefore, if innovations to change the pattern of referrals to secondary care are introduced, it is imperative that the resource consequences are analysed. Interventions that bring 'new' specialist services in to the primary care setting, or extend the existing capacity for in-house management, in general show at least some impact on referral rates or patterns. On the basis of this review, examples include in-house mental health specialists and counselling services, though evidence regarding physiotherapy is more equivocal, as is that concerning open-access schemes. The implementation of in-house services that do not appear to reduce secondary referral raises issues of resource use and quality of service, suggesting that further studies, incorporating assessment of needs, are required. The number of good quality evaluations of innovative schemes to enhance the existing capacity of primary care was notably small, and initiatives in this area should also be supported. The proposed introduction of GP specialists in the NHS should be noted in this context.⁵⁸ Organisational innovations in the structure of service provision need not increase total costs to the NHS, even though costs associated with referral for the innovation may increase.

Changes in spending on secondary care impact directly on resources available for primary care (and vice versa). Where innovations change the pattern and cost of referrals, it is imperative that the resource consequences are analysed. It is important to recognise that because referral is the starting point for a sequence of resource use, and because of the large number of referrals made each year, small changes in rates can have major implications for the health service. However, we found few economic evaluations.

It is not easy to define what constitutes a cost-effective innovation impacting on referrals. The problem lies in defining the end point. For effectiveness, the end point could be health status, but it is more often the quality or appropriateness of the referral, or simply the number of referrals made. When investigating the costs of the innovations, some studies do measure the post-referral costs of care (often for about a year) but many simply measure costs until the referral is made, with no account taken of subsequent care. In addition, the interpretation of an increase or decrease in referral rates as advantageous or not depends upon the individual intervention and the clinical condition(s) it is designed to target.

Where economic evaluations of innovations are undertaken, results should be interpreted with some caution. Reductions in resource use may be reported as potential 'savings'. There may also be shifts in the burden of costs that need to be made explicit; innovations in primary care may increase the costs to primary care, while 'savings' in secondary care cannot be realised but instead free capacity for other uses.

This review contributes to a 'systems' view of the management of demand.^{59,60} The interventions identified here variously reduce or increase access to specialist secondary services, introduce graduated forms of access and affect professional or patient expectations of services. Given the very small number of studies of patient- or public-oriented interventions, the referral effects of self-care or self-appraisal innovations should now be a focus of new research. As primary care trusts take on responsibility, through unified budgets, for more referrals to secondary care, there remains a need for high quality evidence regarding the effectiveness and cost effectiveness of innovations, including their knock-on effects within healthcare systems.

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Supplementary information

Additional information accompanies this paper at <http://www.rcgp.org.uk/rcgp/journal/index.asp>

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