

## **Virtual outreach: a randomised controlled trial and economic evaluation of joint teleconferenced medical consultations**

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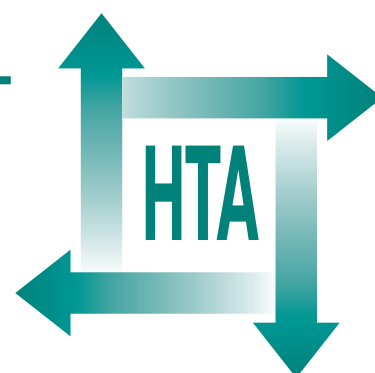
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### **Executive summary**

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NHS R&D HTA Programme**





## Executive summary

### Objectives

Main trial: to test the hypotheses that virtual outreach would:

- reduce offers of hospital follow-up appointments
- reduce numbers of medical interventions and investigations
- reduce numbers of contacts with the health care system
- have a positive impact on patient satisfaction and enablement
- lead to improvements in patient health status.

Economic evaluation: to test the hypotheses that virtual outreach would:

- incur no increased costs to the NHS
- reduce the costs incurred by patients attending outpatient appointments
- reduce the time taken off work
- be more cost-effective than physical outreach clinics.

### Methods

#### Design

The study was principally a randomised controlled trial comparing joint teleconsultations between GPs, specialists and patients with standard outpatient referral. It was accompanied by an economic evaluation.

#### Setting

The trial was centred on the Royal Free Hampstead NHS Trust, which serves GPs in inner city and urban settings in London, and the Royal Shrewsbury Hospital Trust in Shropshire, which serves GPs and patients in small market towns and rural settings. The project teams recruited and trained a total of 134 GPs from 29 practices, 15 in London and 14 in Shrewsbury, and 20 consultant specialists. Of the latter, nine were in medical specialities (gastroenterology 3, endocrinology 1, neurology 1, general medicine 2 and rheumatology 2), and 11 in surgical specialities (ENT surgery 4, orthopaedics 2 and urology 5).

### Subjects

All patients referred by the participating GPs to specialists participating in the trial were included, with the exception of patients requiring urgent assessment, private patients and those with significant difficulty communicating in English. In total, 3170 patients were referred, of whom 2094 consented to participate in the study and were eligible for inclusion, 862 in Shrewsbury and 1232 in London. In all, 1051 patients were randomised to the virtual outreach group and 1043 to standard outpatient appointments. The patients were followed for 6 months after their index consultation.

### Intervention

Virtual outreach services were established in the Royal Free Hampstead NHS Trust in inner London and the Royal Shrewsbury Hospital Trust in Shropshire. Patients randomised to virtual outreach underwent a joint teleconsultation, in which they attended the general practice surgery where they and their GP consulted with a hospital specialist via a videolink between the hospital and the practice.

### Main outcome measures

Outcome measures included offers of follow-up outpatient appointments, numbers of tests, investigations, procedures, treatments and contacts with primary and secondary care, patient satisfaction (Ware Specific Visit Questionnaire), enablement (Patient Enablement Instrument) and quality of life (Short Form-12 and Child Health Questionnaire). An economic evaluation of the costs and consequences of the intervention was undertaken. Sensitivity analysis was used to test the robustness of the results.

### Results

Patients in the virtual outreach group were more likely to be offered a follow-up appointment (odds ratio 1.52, 95% confidence interval (CI) 1.27 to 1.82,  $p < 0.001$ ). Significant differences in effects were observed between the two sites ( $p = 0.009$ ) and across different specialities ( $p < 0.001$ ). Virtual outreach increased the offers of

follow-up appointments more in Shrewsbury than in London, and more in ENT and orthopaedics than in the other specialities. Fewer tests and investigations were ordered in the virtual outreach group, by an average of 0.79 per patient (95% CI 0.37 to 1.21 per patient,  $p < 0.001$ ). In the 6-month period following the index consultation, there were no significant differences overall in number of contacts with general practice, outpatient visits, accident and emergency contacts, inpatient stays, day surgery and inpatient procedures or prescriptions between the randomised groups. Tests of interaction showed evidence of differences in effects by speciality for number of tests and investigations ( $p = 0.01$ ) and outpatient visits ( $p = 0.007$ ). They indicated that virtual outreach decreased the number of tests and investigations, particularly in patients referred to gastroenterology, and increased the number of outpatient visits, particularly in those referred to orthopaedics. Patient satisfaction was greater after a virtual outreach consultation than after a standard outpatient consultation (mean difference 0.33 scale points, 95% CI 0.23 to 0.43,  $p < 0.001$ ), with no heterogeneity between specialities or sites. However, patient enablement after the index consultation, and the physical and psychological scores of the Short Form-12 for adults and the scores on the Child Health Questionnaire for children under 16, did not differ between the randomised groups at 6 months' follow-up.

Overall, NHS costs over 6 months were greater for the virtual outreach consultations than for conventional outpatients, £724 and £625 per patient, respectively (difference in means £99, 95% CI £10 to £187,  $p = 0.03$ ). The index consultation accounted for this excess. Cost and time savings to patients were found (difference in mean total patient cost £8, 95% CI £5 to £10,  $p < 0.0001$ ). Estimated productivity losses were also less (difference in mean cost £11, 95% CI £10 to £12,  $p < 0.0001$ ) in the virtual outreach group. Comparison with physical outreach clinics was not carried out as the required data were not available.

## Conclusions

This trial demonstrated that virtual outreach consultations result in significantly higher levels of patient satisfaction than standard outpatient appointments and lead to substantial reductions in numbers of tests and investigations, but that

they are variably associated with increased rates of offer of follow-up according to speciality and site. The main hypothesis that virtual outreach would be cost neutral is not supported, but the hypotheses that patient costs and productivity losses would be less were supported. Changes in costs and technological advances may improve the relative position of virtual consultations in future.

## Implications for healthcare

These findings have important implications for the design and implementation of virtual outreach services within healthcare systems, and suggest that appropriate patient selection, significant service reorganisation, and provision of logistical support for arranging and conducting consultations will be required to enable such services to operate efficiently. The extent to which virtual outreach is implemented will probably be dependent on factors such as patient demand, costs, and the attitudes of staff working in general practice and hospital settings.

## Recommendations for research

The trial has answered many important questions, but a number of additional issues of significant importance would justify investment in further research:

- The health service usage of patients in the 6-month period following their index consultation was assessed, but it is possible that further benefits would have accrued over a longer period. Further research could involve long-term follow-up of patients in the virtual outreach trial to determine downstream outcomes and costs.
- Although virtual outreach appears to be of limited effectiveness for unselected first-time referrals, there is a real possibility that its effectiveness would be significantly greater if it were used predominantly for follow-up appointments of patients. Further study into the effectiveness and costs of virtual outreach used for follow-up appointments, rather than first time referrals, is therefore recommended.
- The costs of joint teleconsultations in the trial were high for a variety of reasons, but the principal cost component was the initial consultation, involving not only the consultant and the patient but also the GP. Further study is recommended into

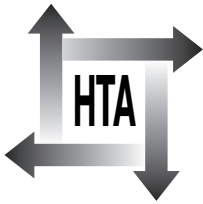
whether the costs of virtual outreach could be substantially reduced without adversely affecting the quality of the consultation if nurses or other members of the primary care team were to undertake the hosting of the joint teleconsultations in place of the GP.

- There is a strong suggestion from the trial findings that the attitudes to the joint teleconsultation of the patients, GPs and hospital specialists all played a very important part in determining outcomes, particularly in

relation to the offer of follow-up and patient satisfaction. There is an important case for undertaking qualitative work in this area.

## Publication

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