

Email consultations in health care: 1—scope and effectiveness

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Electronic communication promises to revolutionise the delivery of health care. In the first of two articles considering the potential for email consultations, Car and Sheikh summarise the evidence about their use for preventive health care, health education, and managing non-urgent conditions

In 1971 Ray Tomlinson programmed and sent the first email message. Widespread public use began in the early 1990s and rapidly spread to the extent that email now represents an integral part of daily life for about 60% of the UK population (fig 1). The popularity of email stems largely from its user friendliness, efficiency, and versatility in facilitating asynchronous communication (see box 1).¹

Increased opportunities for electronic communication have revolutionised many industries and customer services, such as banking and retail, but email's promise for improving delivery of health care remains largely untapped.^{1, 2} In this two part review, we consider the use of email for communication in a clinical context. The first article explores the scope for email consultations for preventive health care, health education, and managing non-urgent conditions. Our second article summarises the evidence describing public and professional attitudes to using email in health care and considers how to ensure its safe use in routine clinical care.

Information sources and selection criteria

We used established systematic review methods to identify systematic reviews and original research studies evaluating the role of email communication in health care.^{w1} We searched the *Cochrane Library*, Embase, and Medline (from 1980 to 2003) and scrutinised bibliographies of identified articles in order to identify additional published material. We searched the internet using general and specialised search engines to identify "grey" literature from sources such as industry reports, legal and strategic documents, and official government healthcare websites. We also searched the National Research Register to identify commissioned research in progress.

Wherever possible, we refer to findings from controlled trials for drawing conclusions about the clinical effectiveness of email delivered care. We have used case reports and case series to help understand recent developments and inform safety considerations.

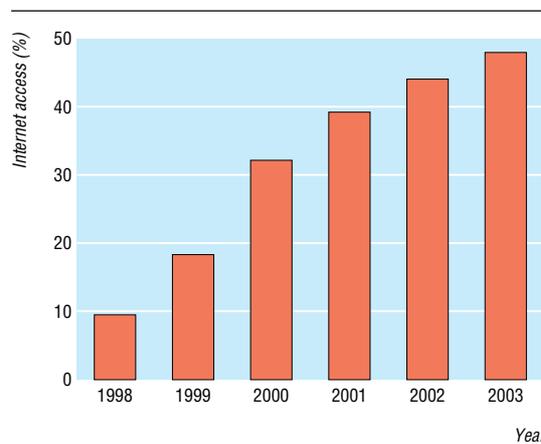


Fig 1 Trends in home access to the internet in UK households. Most people use the internet for email communication. (Data source: National Statistics Omnibus Survey 2003)

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Improving access to health care and health information

The Institute of Medicine encourages flexible consulting as a key strategy for improving the quality of health care. It notes that "access to care should be provided over the Internet, by telephone, and by other means in addition to in-person visits ... Instead of a \$65 office visit and a half-day off work, a 2-minute e-mail communication could meet many patients' needs more responsively and at lower cost."¹

Missed appointments

Non-attendance rates for general practice and hospital outpatient appointments in Britain are about 12% overall and range from 5% to 34% across different specialties and between regions.^{w2} The cost of missed appointments amounts to over £400m (\$730m, €595m) a year. Letter or telephone reminders, particularly with the option of patient confirmation or



Extra references (w1-w24) are listed on bmj.com

re-booking, have been shown to reduce non-attendance rates.³⁻⁵ Although there is currently no good quality evidence, the effect of email reminders may be similar. Email is potentially ideal for sending reminders as this can be automated (with inclusion of extra information, such as about the clinic or parking facilities). Email could also be convenient for patients as it offers the possibility of rescheduling or changing an appointment without the difficulties of “getting through” by telephone or the potential embarrassment of feeling obliged to explain the reasons for cancellation.

Triage

Katz et al investigated a triage based email system in a randomised controlled trial in primary care.⁶ Patients in the intervention arm were encouraged to use email to communicate with their doctors and clinic staff

about appointments, health concerns, prescription renewals, referrals, and billing. All emails were automatically routed to a central resource account managed by a nurse “navigator” who then directed messages to appropriate staff. Doctors received copies of all messages but replied only to those requiring their input. The authors found that email increased the communication burden on clinicians and staff and did not substitute for telephone consultations. They concluded that email was of limited use in improving the efficiency and effectiveness of clinical care.

Though its conclusions were negative, this trial provides helpful insights into the nature of email consultations. For example, content analysis of patient emails revealed that almost all patient communications were judged to be appropriate in addressing patients' needs. The study clearly showed that face to face visits and telephone consultations remain patients' preferred modes of communication for many healthcare issues, especially those thought to be complex or sensitive. Patients endorsed the use of email for straightforward issues such as communication of cholesterol test results or a normal cervical smear test result. Furthermore, email was the preferred way of dealing with relatively minor problems such as a sore throat or back pain. This suggests that email communication addressed an unmet access need for some patients in primary care: it provided an additional means of communication for patients who might not otherwise communicate with their doctors about such issues as new symptoms or resolution of problems.

This study also suggested that patients who used email with their clinicians were a distinct group from those who used the telephone or made frequent visits. The former patients were generally younger, more educated, and healthier. Somewhat surprisingly, two thirds of the patients in the study felt uncomfortable with clinic staff triaging their messages, whereas doctors favoured this arrangement. This suggests that patients view email as a more intimate mode of communication than do many doctors, thus potentially limiting its usefulness as a triage tool.

Preventive health care

Invitations and reminders are an effective way to maximise preventive care benefits.⁷ These contacts have traditionally been by post or telephone to inform patients that they are due for services such as paediatric immunisations, cervical smear tests, mammography, and heart disease risk assessment. Email could be an attractive, low cost alternative, but few healthcare organisations currently offer this service.^{w3 w4} There is no evidence yet on the areas in which such invitations and reminders are effective or on ways to maximise their impact (such as by personalising contacts).^{8 w5 w6}

Patient and public health education

There is a wide (and possibly widening) gap between the need for sharing information with patients and the relatively limited opportunities for face to face communication between patients and clinicians. With advances in information technology, however, “access” now includes availability of specialised health information to the public via email (for example, NHSDirect Online or the National Asthma Campaign's e-helpdesk) and the internet.^{w7-w11}

Box 1: Potential advantages of email in delivering health care

Convenience

- Increased convenience in time and space for patient and doctor. Email can be sent and received at any time from almost anywhere—via computer, digital television, personal digital assistant, or mobile phone
- May reduce the need for face to face consultations (time savings)
- Useful for information that patients would have to remember or write down if it were given orally (such as addresses and telephone numbers of services to which patients are referred, test results with interpretations and advice, instructions on how to take drugs, and preoperative and postoperative instructions)
- Unlimited length (in addition to text, users can send virtually any kind of electronic file as an attachment)

Access

- Increased access to care (for those with physical disabilities or those living in a remote area, for example)

Information sharing

- Increased opportunities for information sharing (such as sending patients information leaflets or highlighting relevant information on the internet)
- User friendly medium for patients to ask for further clarification after a face to face consultation
- Potential for increased reporting of unpleasant events
- Allows patients to discuss content of messages with family or friends to improve understanding

Satisfaction

- Potentially a more egalitarian medium of communication as traditional barriers of age, rank, and unfamiliarity tend to dissolve in the informality of electronic communication
- Free style of writing (people increasingly favour a direct parlance, which minimises the time taken to write and read messages but also suggests a desire for greater immediacy and directness in conversation)
- Possibility of anonymity for patients
- Speed of communication
- May be particularly suitable for groups that are difficult to reach by traditional, face to face contact

Quality of care

- Doctors can consult with colleagues and other professionals to provide a more considered response
- Email creates a written record of consultations and avoids possible problems of illegibility associated with handwritten notes

Improved efficiency

- Ability to offer routine transactions and patient education information to several people simultaneously
- Potential cost savings

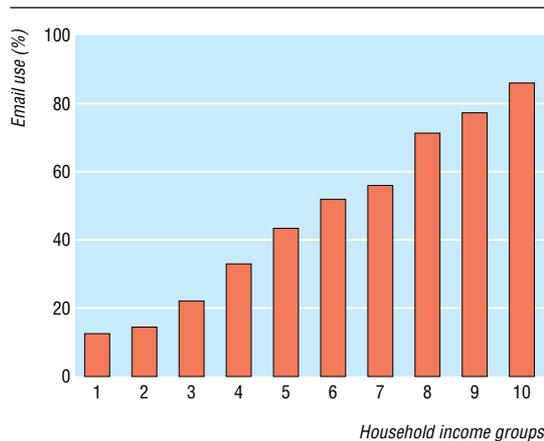


Fig 2 Use of internet and email among UK adults by income (households divided into tenths according to gross income). Use is concentrated in higher income groups. (Data source: National Statistics Omnibus Survey 2003)

Surveys of unsolicited email sent to various e-helpdesks show that much of the advice requested by patients with chronic conditions is about day to day issues to do with work and school, clarifying misunderstandings, and attempts to obtain and interpret the latest research findings.^{2 9 w12 w13}

Facilitating clinical management

There is little empirical evidence about the effectiveness of email in helping management of acute and chronic disorders. However, the few studies so far undertaken suggest great potential for email.

Professional-patient communication

Most interventions studied to date combined use of email and the internet. Randomised controlled trials of weight loss programmes conducted via the internet found that adding email counselling to internet intervention significantly improved their effectiveness.^{10 w14} In these studies neither patient nor counsellor had any previous knowledge of or relationship with each other and communicated only by email. Other conditions for which combined use of email and internet has been favourably evaluated are treatment of depression, recurrent headache, panic disorder, and distress associated with tinnitus.^{11 w15-w18} High dropout rates and delays in completing treatment are common in studies of email based treatment, but these limitations should be weighed against the potential cost effectiveness of the intervention.^{w15 w16 w19}

In a case series of patients with anorexia nervosa email contact offered a useful adjunct to treatment, had emotional value, and was highly acceptable to patients. Patients reported that emails increased their sense of being in touch with and looked after by the clinician and, furthermore, required them to be more attentive to therapeutic tasks. Clinicians also gave positive views, indicating that reading and responding to emails was not unduly time consuming.¹²

Several studies have shown the benefit of computerised communication in diabetes care.¹³ Adding email communication to these interventions can reduce the number of face to face visits, improve quality of care, and improve quality of life.^{w20}

Concordance and follow up

Email provides a new avenue for reporting, monitoring, and feedback of patient self care assignments. It can be used to enhance patient involvement in treatment and strengthen therapeutic alliances. Email reminders (automated, two way) can encourage adherence, remind, educate, and solicit responses about side effects and self reported adherence to medication.¹⁴

In one UK survey most patients undergoing day surgery (varicose vein surgery, inguinal hernia repair, or vasectomy) believed that they would not benefit from an outpatient appointment after surgery.^{w21 w22} Email follow up consultation may be a middle course between the extremes of face to face review or no review consultation at all.^{w22} Obtaining postoperative (or preoperative) information electronically may seem impersonal, even if efficient. However, several surveys consistently found that respondents were more honest in reporting sensitive information when responses were obtained by electronic questionnaire rather than by an interviewer.^{w23 w24}

Communication by email may not always be the optimal strategy, however, as shown by a recent study of email follow up after emergency department visits, which found it to be less efficient than telephone communication.¹⁵

Directions for future research

The strong drive to incorporate email consultations into routine clinical practice should proceed on the basis of secure evidence. As this field is still in its infancy, the research agenda covers all aspects of email communication in health care. This needs to begin with a detailed understanding of patient and professional preferences for modes of communication and why; an appreciation of how email consulting can best be integrated with other modes of consulting; the influence of email consulting on the patient-doctor relationship (for example, clinicians may be more defensive and patients consult for more trivial problems than in traditional consultations); identification of populations most likely to benefit from email communication; and understanding of safety, training, security, and interface issues.

Box 2: Potential disadvantages of email use in delivering health care

- May widen social disparities by allowing preferential access to wealthier people and young middle class adults
- Like other forms of written communication (such as letters and faxes), email does not easily provide the subtle emotive cues often gleaned from vocal intonation and physical demeanour that aid interpretation. Scope for non-verbal communication is currently very limited
- Inability to examine the patient
- Inability to use touch in the clinical encounter
- May increase the risk of diagnostic or communication errors
- Potential slow responses to messages that might require emergency actions
- Threats to patient privacy (including unauthorised interception of unencrypted emails, receipt or retrieval of emails by unauthorised people, inappropriate physical security measures)
- Providers may be overwhelmed by the volume and length of emails

Summary points

About 60% of the UK population now has access to email, and its use is increasing rapidly worldwide

Email consultations have the potential to play an important role in delivery of preventive health care and in facilitating self management of chronic disorders

There is little evidence yet from controlled clinical trials that this potential benefit can be translated into routine clinical care

Successful communication by email depends on a clear and shared understanding by patient and healthcare professionals of its role, advantages, and limitations

Questions such as how clinicians can be patient centred in email consultations require innovative approaches to researching consultations that place emphasis on semantics (as written words are the sole conveyors of information). Because of the intricate ways in which email combines human communication and information communication technology, interdisciplinary research is essential.

We know that a large part of a verbal message's impact derives from the communication style and the clinician's "image" and appearance rather than the content. Will the user interface and the application's functionality (that is, the program design and layout) take this role in email consultations and become a critical element in the human-computer-human interaction? Examples of questions about interface design include, "Should different interfaces be used for different populations considering factors such as age, preferred language, and (computer) literacy?"

As email consulting increases, we need to ensure that those without email access to care are not unduly disadvantaged (see fig 2 and box 2). Mechanisms for ensuring equitable access to care for sections of the population who do not use email are essential.

Conclusions

Healthcare systems are evolving throughout the world and are now embracing the concepts of patient-clinician partnership and patient self-management. In this context, email consultations provide exciting possibilities to augment and facilitate healthcare delivery.

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Contributors: AS and JC conceived the idea for this review. JC conducted the searches, evaluated the study quality, analysed the data. AS contributed to the search design, quality evaluation, data analysis and interpretation. JC wrote the first draft of the paper; both authors jointly wrote the paper subsequently. Both authors are guarantors for the paper.

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Corrections and clarifications

A memorable patient: How life events change patients' perspectives of their conditions

Our complex electronic system failed when it came to attributing authorship to this Filler article, with the result that the names and affiliations of two of the three authors "dropped off" (24 July, p 229). The correct authorship (now amended on bmj.com) is: Alison Duncan, specialist registrar in dermatology, Richard Azurda, consultant dermatologist, Royal Liverpool and Broadgreen University Hospitals NHS Trust, Liverpool; Julian Verbov, professor of dermatology, Royal Liverpool Children's Hospital. We apologise for the omission.

Randomised controlled trial assessing the impact of a nurse delivered, flow monitored protocol for optimisation of circulatory status after cardiac surgery

In table 2 of the full version of this paper (<http://bmj.bmjournals.com/cgi/content/full/329/7460/258/TBL2>) by Moira McKendry and colleagues (31 July, pp 258-61) we inadvertently spelt out the abbreviation CFT incorrectly—the term "corrected flow volume (ms)" should be "corrected flow time (ms)."

In brief: TIA patients need assessment

In this news article about new guidelines on transient ischaemic attack from the Royal College of Physicians (10 July, p 68), a query over the college's website address was not resolved and we published the wrong URL. The correct URL is rcplondon.ac.uk