Virtual webcam clinics: Benefits and challenges. The Newham experience

Joanne Morris, Desiree Campbell-Richards, Joseph Wherton, Sara Shaw, Shanti Vijayaraghavan, Trisha Greenhalgh, Rita Sudra, Anna Collard, Emma Byrne, Teresa O'Shea

Webcam consultations are being introduced in various NHS organisations to address the rising prevalence of chronic conditions, poor outcomes, the problem of missed appointments and the policy push for new models of technology-supported "care closer to home". Such work is timely given the increase in access to broadband in people's homes. Whilst there is much enthusiasm for this new model of care, evaluations are sparse. This article describes the experience of introducing webcam consultations over the past 6 years in the London Borough of Newham. The service was initially trialled with the young adult population, who had a high non-attendance rate for face-to-face consultations but also good access to broadband and high computer literacy. The article presents quantitative and qualitative data on how the service was received, with a particular focus on the benefits, challenges and learning for other organisations.

With a high and rising prevalence of diabetes in the UK, particularly in some urban areas such as the London Borough of Newham, where the mean age of onset of type 2 diabetes is decreasing, services need to address capacity issues as well as improve their efficiency to meet the ever-changing needs and lifestyles of patients. Problems of access are particularly significant in the increasingly mobile young adult population, in whom non-attendance rates were as high as 51% in Newham at the outset of this project (compared to 29% for the over-25s).

Webcam consultations are being introduced in various organisations to address these issues, which is particularly timely given the increase in access to broadband in people's homes (now at approximately 80% in Newham; London Borough of Newham, 2014) and following various policy initiatives that wish to harness the potential of new technologies and bring care "closer to home" (Monitor, 2015). A recent summary of the literature has concluded that there are few studies relevant to our research; however, those that have been undertaken were broadly positive about the potential of virtual online consultations (Greenhalgh et al, 2016).

In this article, we describe the experiences of the Newham diabetes service, which began trialling webcam consultations 6 years ago, initially with the young adult population and then more widely in diabetes outpatient clinics. In particular, we focus on the benefits, challenges and lessons learnt.

Methods
Organisational approval
A steering group was established with representation from service users, service departments, clinicians and local Clinical Commissioning Groups (CCGs). The local CCG agreed to continue paying the same tariff as for face-to-face appointments for the duration of the trial. Clinical and governance risks were considered and patient information and consent approved. Computer and technical support for the trial was agreed.

Article points

1. Traditional models of routine outpatient care are often inefficient and ineffective, failing to provide accessible and timely care to the growing population with diabetes.

2. The Newham diabetes service now offers online webcam consultations as an alternative to face-to-face contact, as part of existing diabetes clinics.

3. Benefits are most notable for patients, who appreciate the convenience and immediacy of access. Non-attendance rates are also lower, at 13% for webcam consultations compared with 28% for traditional outpatient appointments.

4. Challenges were mainly organisational: working with various support departments to set up and maintain the service whilst minimising risks.

Key words

- Access
- Skype
- Virtual clinics
- Webcams

Authors

Author details can be found at the end of the article.

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Box 1. Practical steps to consider when setting up virtual webcam clinics (not an exhaustive list).

How and why?
- Consider patient broadband usage and demand for service.
- Consider suitable clinic setup: criteria for selection of patients, virtual or mixed clinics, follow-up-only appointments, timing (group appointments?), *ad hoc* or patient-initiated contacts?
- What evaluation criteria are required to judge the success of this service?

Approvals and buy-in
- Seek senior approval from a Clinical Governance perspective.
- Commitment from senior management and agreement of tariffs.
- Approval from Information Governance; agree patient information/consent procedures and risk assessment/management.
- Work with the IT department to establish roles and processes to assist use of the technology, including modification to appointment systems (webcam appointment types), installing and updating software.
- Conduct full risk assessment of the new service in the proposed clinical setting, including all potential clinical and governance risks.

Setup
- Purchase webcams, install software and set up clinic accounts; modify appointment booking systems.
- Modify patient communications (e.g. appointment letters).
- Clarification of roles/new ways of working and training for departmental staff (e.g. front desk receptionists, booking patients in and out, dealing with late-running clinics).

Recruitment and consent
- Discussion with suitable patients, take verbal consent to proceed and ask for additional contact details. Provide patients with information to take away and consider further.
- Record patients' Skype usernames; clinician to send contact request.
- At first appointment: clinician to contact patient, go through privacy and security statement online, give patient right to opt out, log verbal consent on patients' records.

Service evaluation
- Capture audit information/evaluation criteria.

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Further practical steps to consider when setting up webcam consultations are presented in *Box 1*.

Participants

Suitable patients attending routine follow-up diabetes appointments (with one consultant physician and one diabetes specialist nurse [DSN]) were offered webcam consultations, using readily available video-conferencing software. Exclusion criteria included complex comorbidity and the need for physical examination, as judged by the clinician, and lack of familiarity with the patient. Patients with limited English proficiency were offered the use of a health advocate, who would sit with the clinician; however, they typically preferred to use a family member or friend, at their end, to translate for them.

As the service was taken up, patients began to initiate their own appointments with the DSN; as a result, the nurse made herself available to be contacted any time she was working and not seeing other patients. The consultant also introduced a 1-hour slot at the end of one weekly clinic for patient-initiated contact.

Service evaluation

Outcome measures included recruitment figures, did-not-attend (DNA) rates, duration of appointments and qualitative findings from 43 in-depth patient interviews (19 of which were conducted over the phone), three staff interviews, four patient focus groups, one staff focus group, written observations from staff and detailed case note analysis.

Results
Recruitment and uptake

Approximately 80% of patients seen at the diabetes service were considered suitable for webcam appointments. In total, 104 patients were recruited to webcam appointments over a period of 4 years.

Table 1 shows the uptake of the webcam service by age in the first year of recruitment, including 18 young people aged <20 years. The acceptance rate was high (approximately 80%) in people aged <50 years but was lower in those aged ≥50 years. The acceptance rate was 78% in patients aged <20 years. Among the overall cohort, the main reasons given for declining the offer of a webcam appointment were lack of access to the internet at home (52%), preference for face-to-face consultations (18.5%) and lack of confidence with the internet/computer (9%).

Non-attendance rates

The overall DNA rates between 2011 and 2014 were 13% for scheduled webcam appointments and 0% for patient-initiated webcam appointments (i.e. all patient-initiated appointments were kept). This compares with a DNA rate of 28% for all outpatient appointments among the same patients over the same time period.

The DNA rates appeared to be influenced by the reliability of the technology. We initially used

a more sophisticated commercial package but experienced frequent technical problems as the bandwidth requirements were too demanding for most home computers. We therefore switched to Skype, a free audio and video chat service (Skype Communications SARL, Luxembourg), and since then the technical problems have mostly been resolved. DNA rates only began to fall after the switch to Skype.

Duration of appointments/productivity

The mean durations of the different appointment types are shown in *Table 2*. Whilst appointments were significantly shorter in webcam consultations, the clinical case mix was different owing to the absence of a physical examination. Overall, however, there was increased productivity in the clinics, in that the consultant found she could book one or two additional patients per clinic.

Cost savings to patients

Questions relating to cost from 43 patient interviews revealed that, whilst using webcam appointments, the majority saved money from travel and parking, with a minority (around a third of those asked) reporting that they saved income by not having to take so much time off work.

Convenience

Almost all patients commented that the webcam appointments saved them time and greatly enhanced flexibility, allowing them to fit consultations around their everyday lives, and this led to fewer missed appointments. Patients perceived shorter waiting times and, if they did have to wait, they were able to use the waiting time more effectively (e.g. by continuing with their work).

Usage patterns

The nurse observed that patient-initiated consultations were often used differently; some patients would make a lot of short appointments in a short space of time, whilst in a crisis, and then not make contact for some time. Patients reported feeling more connected to the service and more confident, and the fact that they could access the nurse when needed provided reassurance, described as being like a safety net.

Table 1. Uptake of the webcam service, by age group, in the first year of the project.

Age group (years)	Patients asked (*n*)	Patients agreed (*n*)	Acceptance rate
<20	23	18	78%
20–29	50	40	80%
30–39	9	9	100%
40–49	9	8	89%
50–59	11	7	64%
60–69	14	4	29%
70–79	19	2	11%
80–89	6	0	0%
90–99	2	1	50%
Total	**143**	**89**	**62%**

Quality of care

When asked about quality of care, patients and staff were consistently positive, although they agreed that webcams would not be appropriate for every consultation (e.g. when requiring physical examination or hands-on practical assistance). Patients highlighted how video communication (unlike the telephone) supported dialogue about their condition through visual and non-verbal cues. Younger patients reported greater continuity of care, as they were able to see the same clinical team when away temporarily (e.g. at university or college, or during frequent travels).

Technology limitations

When discussing quality, clinicians emphasised that the technology had to be used appropriately and needed to be working effectively. Following the switch to Skype, most technical problems encountered were due to local problems and were nothing to do with the software. Occasional upgrades to software were required, which needed someone from the IT department to respond quickly and install them.

Dynamics and patient–clinician relationships

There were mixed views on how comfortable patients felt when using the webcam. Some felt

Table 2. Mean duration of the different appointment types.

Appointment type	Mean duration (minutes)
Consultant: face-to-face	25
Consultant: webcam	9
Nurse specialist: face-to-face	30
Nurse specialist: webcam	9

that an element of "reality" present in face-to-face consultations was missing from the virtual appointments. However, the nurse found that some young people she knew well enjoyed "inviting her into their home", using the webcam to show her around their room. Participants attributed the quality of the conversation via webcam to the quality of their existing relationship with the clinician. Hence, webcam appointments were not considered suitable for newly diagnosed patients or if the doctor or nurse had changed.

Focussed attention

Although some patients felt less comfortable, many talked about an improvement in the level of engagement they perceived from their clinician, with more "focussed attention". They felt that the clinician spent a greater proportion of the consultation looking at them and focussing on what they were saying.

Non-responders

A minority of patients, across all age ranges, did not engage at all, even when it would appear to be to their advantage. Some of these were patients who are typically considered "hard to reach". These patients might not currently appreciate the need to engage or it may be a low priority. Patient-initiated appointments are an important step in making services available when needed by such patients. However, there is still a minority of active service users, of all ages, who prefer seeing their clinician face to face.

Clinical outcomes

Among clinical outcomes, HbA_{1c} and emergency admissions were recorded. There was some indication of an improvement in HbA_{1c} levels; data from 49 patients who actively used Skype for more than 1 year showed an improvement from a mean of of 70 mmol/mol (8.6%) before Skype to 65 mmol/mol (8.1%). However, as this was a pilot study and not conducted in a controlled fashion, the data were not appropriate for statistical analysis. Emergency admission rates were analysed but the findings were inconclusive and needed to be treated with caution owing to confounding factors and the small number of events recorded.

Discussion

Patients appeared to benefit from these virtual clinics, reporting that webcam consultations were much more convenient and accessible, even saving them money. They also perceived the clinician to be more "focussed" on them. Other investigators have also found webcam consultations to be shorter and more focussed or intense (Pols, 2011; Levy et al, 2014), with a greater percentage of time spent looking patients in the eye compared with face-to-face consultations (92% vs 50%; Sävenstedt et al, 2005).

Patients and clinicians alike perceived the quality of care provided in webcam consultations to be as good as that provided in person. The patient-initiated appointments with the DSN were particularly valued by patients and were always kept.

Unless staff save travel time (such as from a reduction in the number of home visits, as described by Finkelstein et al, 2006), then initial savings for the health service are harder to identify. Initial savings in our study were modest and related to increased efficiency and productivity. Appointments were shorter and DNA rates fell significantly, resulting in a more efficiently running clinic and greater income from tariffs. The consultant was able to book one or two more patients into each clinic. It is also anticipated that improved access to services will, in time, lead to fewer diabetes complications and a related reduction in avoidable emergency admissions, which would massively support the economic argument for webcam appointments. It has been suggested that about half of all hospitalisations for diabetic ketoacidosis could be avoided with better outpatient care and diabetes self-management (Kaufman and Halvorson, 1999; Curtis et al, 2002).

Limitations

Virtual clinics led to a change in the dynamics of the consultation, which for some made it feel more impersonal. It was agreed that a prior patient–clinician relationship was important, as has been argued by Pols (2011). Hence, if a locum doctor is used, patients may need to switch to a face-to-face appointment. Physical presence was also considered important by some users for

meaningful emotional support, hands-on practical assistance (e.g. instructing on how to operate an insulin pump) and effective collaboration and problem-solving that required the sharing of numerical or visual information (e.g. logging records or trends in blood glucose readings). At least once a year, a physical examination is also required; therefore, it was agreed that there is a need to continue with an appropriate mix of face-to-face and webcam consultations.

Our experience with the two software types demonstrates that reliability of the technology is vital and that sometimes a simple solution is best. Call quality may be affected on mobile devices, and so virtual clinics may be most appropriate when patients are at home.

Challenges

Communication across the organisation was a challenge. Frequent staff changes and a Trust merger meant that new staff (including front-line staff) needed to be repeatedly made aware of the project. Consequently, IT support requests were often not actioned and support needed to be renegotiated. Importantly, however, from a governance perspective, there were no critical events.

It was found to be necessary to manage patients' expectations as to when the clinician would respond and the types of request that could be met. Patients were made aware that Skype text messages might not be checked at times and were not to be used for emergencies; they were also not to be used for administrative processes, such as asking the clinician to book or reschedule appointments. Overall, this access was used appropriately by patients, and the nurse found she was able to manage the service within her existing hours; over half of her webcam consultations became patient-initiated.

A suitable tariff needs to be agreed to support payment for webcam consultations. Over the longer term, this needs to be set at a realistic level to reflect the work done whilst avoiding disincentives to participating in webcam consultations. Initially, organisations may be able to negotiate the same tariff as for face-to-face appointments, acknowledging the additional costs involved in setting up the service, until the costs and savings can be better understood.

The IT department needs to support the installation of software on computers and maintain updates, as well as changing the electronic appointment system. Information Governance needs to conduct assessments and approve any identified risks, and agree to patient consent procedures.

Setting up webcam consultations was a high priority for the diabetes department but not necessarily for the other busy support departments. In our case, establishing a steering group with senior representation from each department helped gain support and commitment. Ensuring communication of decisions from senior management to front-line staff, such as those on the IT service desk, was also important. Guidelines developed by the VOCAL (Virtual Online Consultations: Advantages and Limitations) team (Wherton, 2016) and from the Information Governance Alliance (2016) are now available; these should be shared with all relevant departments. A named person in each department who can influence progress and make decisions is key.

Relevance to young people

This intervention makes sense for young people, who are in a state of transition and find contact with services challenging, but who are highly IT-literate and adept at using technology in every other part of their lives. Retaining contact remotely with a known clinician during temporary moves (e.g. for study, work and travel) helps younger patients maintain an important contact. Young people may find it easier to speak with a trusted clinician whom they know well.

Importantly, where individuals have a good prior relationship with their clinician, the webcam consultation has been shown to enhance that relationship. Pols (2011) reported similar findings to our study, stating that:

"What the webcams magnified were the existing characteristics of the social relationships between the webcam users. The person encountered over the webcam who was strange and unknown, became even stranger, maybe even scary or intrusive. A friend or the trusted carer became even closer, as the webcam communication and support was added to an already good relationship, thereby intensifying it."

Page points

1. Suitable tariffs need to be agreed to support the initial costs of setting up virtual clinics.

2. Communication across the organisation, particularly between the diabetes and support departments, is essential.

3. Patients' expectations also need to be managed.

4. Virtual clinics may be particularly useful for young patients, who often find it difficult to stay in contact with their healthcare providers but who are highly IT-literate.

"Web-based consultations can provide more accessible, efficient and timely care, whilst maintaining quality and improving patient experience, which is particularly important for mobile, younger patients."

In our study, consultations between the nurse and patients she knew well were enhanced, as patients enjoyed "inviting her into their home".

With competing priorities for their time, convenience and cost are also particularly significant factors for younger patients. Although not tested in this study, we believe this intervention would also be popular with children and their parents, particularly because of the inconvenience that attending appointments presents to a whole family. Older children may also be able to speak to the clinician alone remotely, enjoying the privacy this can bring.

This pilot of webcam consultations had a high uptake rate (approximately 80%) among patients under the age of 50 years. It is surprising that the rate was not highest in the under-20s; however, our results might have been influenced by the small sample studied. Interestingly, it appears there will always be individuals who do not want to take part, even though clinicians may consider them ideal participants (i.e. young and IT-literate).

Conclusion

This project has demonstrated that setting up webcam consultations within a busy inner city environment, although challenging, can be worthwhile. Web-based consultations can provide more accessible, efficient and timely care, whilst maintaining quality and improving patient experience, which is particularly important for mobile, younger patients. We hope that, in time, associated health benefits will follow, with knock-on efficiency savings for services such as Accident and Emergency.

Further work is ongoing to understand the changes in dynamics within webcam consultations, the potential to positively impact self-management behaviour, and the local and system-wide changes required to embed this intervention over the longer term (Greenhalgh et al, 2016).

Further research should also be done to look at the potential of this service to reach patients who are otherwise considered "hard to reach", and for younger patients who are in the process of transitioning between child and adult services. ■

Authors
Joanne Morris is Researcher/Research Manager at Barts Health NHS Trust, London; Desiree Campbell-Richards is Diabetes Research Nurse at Barts Health NHS Trust; Joseph Wherton is Senior Researcher at University of Oxford; Sara Shaw is Senior Researcher at University of Oxford; Shanti Vijayaraghavan is Consultant Physician at Barts Health NHS Trust; Trisha Greenhalgh is Professor of Primary Care Health Sciences at University of Oxford; Rita Sudra is Diabetes Nurse for Young Adults at East London NHS Foundation Trust; Anna Collard is an independent research consultant; Emma Byrne is Research Assistant at Queen Mary University of London; Teresa O'Shea is a retired Diabetes Specialist Nurse, formerly at East London NHS Foundation Trust.

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