QUALITY IMPROVEMENT REPORT

Developing a virtual geriatric perioperative medicine clinic: a mixed methods healthcare improvement study

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Abstract

Background: the Geriatric Perioperative Care clinic at North Bristol NHS Trust was suspended in March 2020 during the COVID-19 pandemic. A virtual clinic was piloted to deliver preoperative health optimisation and shared decision-making for patients undergoing critical elective surgery. No literature existed on virtual preoperative clinics for older people to support the development.

Objective: this healthcare improvement study describes the setup and delivery of the virtual clinic as its primary aim. Secondary aims included: assessing older people’s access to technology and their digital literacy for virtual consultation; to describe barriers and facilitators for consultations, as well as evaluation of patient and clinician satisfaction with the consultations’ mode of delivery and outcomes.

Methods: a mixed methods healthcare improvement study was undertaken through plan-do-study-act cycles, semi-structure interviews, and quantitative service benchmarking.

Results: the pilot evaluated 67 preoperative consultations (43.3% video, 56.7% telephone, mean age 75) with a mix of surgical pathology (vascular 88.1%, colorectal 10.4%, urological 1.5%). Patient feedback demonstrated improved understanding of conditions (90.6%), and adequate opportunity to express opinions and questions (96.2%). Clinicians preferred video consultations (adequate to deliver services: 89.7% video; 68.4% telephone). The greatest barriers to engagement, none of which were exclusions to participation, included cognitive impairment, sensory impairment, or needing technical assistance setting up video consultations (52.2%).

Conclusions: delivering a virtual preoperative medical optimisation and shared decision clinic for older people is feasible. This study will aid other units in developing their own virtual preoperative clinics. Future work should evaluate perioperative outcomes of delivering a face-to-face versus virtual clinic.

Keywords: perioperative care, frailty, geriatrics, outpatients, telemmedicine

Key points

• Virtual preoperative clinics for older people are feasible
• Effective medical optimisation and shared decision making can be delivered via a virtual clinic
• Patients and clinicians positively rated delivery of care via a virtual clinic
Introduction

North Bristol NHS Trust’s (NBT) Geriatric Perioperative Care (G-POC) clinic delivers preoperative assessment, medical optimisation and shared decision-making for older people. Despite suspension of most elective surgery during the COVID-19 pandemic, some patients classed as ‘obligatory’ by NHS England still required surgical consideration [1]. In March 2020, the face-to-face G-POC clinic was suspended due to the geriatrician workforce shielding or being redeployed. In order to continue offering a service, we piloted a virtual clinic.

The Royal College of Physicians ‘Outpatients – The Future’ calls for alternatives to face-to-face consultations [2]. The NHS long-term plan encourages meeting patient needs via technology [3]. A systematic review found outpatient telemedicine for older people was beneficial, cost effective, and garnered high patient satisfaction [4]. However, none of the studies were UK-based, nor conducted in preoperative assessment.

The primary aim of this healthcare improvement study was to describe the setup and delivery of a preoperative virtual clinic for older people. Secondary aims included:

• Assessment of whether older surgical patients have the required technology and digital literacy for virtual consultation.
• Description of barriers and facilitators to virtual consultation in older surgical patients.
• Assessment of patient and clinician satisfaction.
• Description of the components of comprehensive geriatric assessment (CGA) that can be delivered virtually.
• Assessment of the impact of virtual consultation on clinic attendance.

Methods

This study was registered with NBT’s Quality Assurance and Clinical Audit Department (ID QI78253). No funding was obtained for the study.

Context

NBT is a tertiary referral hospital in Southwest England. Referrals to the G-POC clinic are made by a surgeon or anaesthetist on the basis of perceived need. Although no formal referral criteria exist, most referrals are made for multimorbidity management or shared decision making. Strong links have been formed with multiple surgical departments, particularly vascular and colorectal. Following clinic assessment, a plan is sent to the patient, GP and perioperative team. Patients also attend conventional face-to-face anaesthetist-led preoperative assessment.

Intervention

This pilot was conducted between 22 May and 17 July 2020. All patients were primarily offered a video appointment, with telephone offered only if video was declined. Video consultations used the Attend Anywhere platform [5]. The administrative team undertook a brief discussion about connectivity and subsequently emailed an appointment hyperlink and instruction leaflet to the patient or their carer.

Three shielding geriatricians conducted the consultations, all of whom were experienced in delivering the face-to-face G-POC clinic, but had not previously delivered any virtual clinics. Patients were still invited to attend face-to-face surgical and anaesthetist-led clinics.

Study of the intervention

Description and development of the pilot clinic

Data were collected prospectively for: patient demographics, CGA domains assessed, scoring tools used, interventions made, non-attendance rates, and consultation length.

Plan-do-study-act (PDSA) cycles were undertaken by the department in fortnightly meetings. A theoretical framework based on key features of PDSA was followed and documented in a single results table [6]:

• Plan: Adjustments to the delivery of the clinic were proposed including processes, documentation, and assessment tools.
• Do: Proposed changes were trialled in subsequent consultations with clinician feedback reported.
• Study: Changes were evaluated in subsequent meetings, including analysis of clinician feedback.
• Act: Proposed changes to the clinic were agreed on to be revised or incorporated into the ongoing virtual clinic consultations.

Patient feedback telephone survey

The survey was conducted by staff not involved in the service or analysis. The design incorporated Likert scales, multiple-choice and semi-structured questions.

Clinician feedback

Clinicians were asked to rate the adequacy of consultations with free text comments invited.

Analysis

Quantitative data were analysed using descriptive statistics. Qualitative responses were documented by the surveying staff on standardised case reporting forms and collated within a spreadsheet. Recording and transcripts were not used. Responses were examined by one clinician (AJ) for specific patterns, coded themes were reviewed, and higher order thematic headings drawn out, these were validated by a second clinician (AC), then reviewed by a third clinician (PB). A content analysis was performed using these thematic headings to rank the findings.
Table 1. Patient demographics

|                          | Total (n = 67) | Video (n = 29) | Telephone (n = 38) |
|--------------------------|---------------|---------------|-------------------|
| **Age**                  |               |               |                   |
| Median (IQR)             | 75 (69–80.5)  | 75 (70–80.75) | 75 (69–80.5)      |
| **Proposed operation**   |               |               |                   |
| Vascular                 |               |               |                   |
| Open AAA repair          | 6 (8.9%)      | 3 (10.3%)     | 3 (7.9%)          |
| Open or endovascular AAA repair (undecided) | 15 (22.4%) | 7 (24.1%) | 8 (21.1%) |
| Standard EVAR            | 2 (3.0%)      | 0 (0.0%)      | 2 (5.3%)          |
| Complex endovascular AAA repair | 23 (34.3%) | 13 (44.8%) | 10 (26.3%) |
| Common femoral endarterectomy | 5 (7.5%) | 1 (3.4%) | 4 (10.5%) |
| Lower limb bypass        | 8 (11.9%)     | 2 (6.9%)      | 6 (15.8%)         |
| **Colorectal**           |               |               |                   |
| Right hemicolectomy      | 4 (6.0%)      | 1 (3.4%)      | 3 (7.9%)          |
| Defunctioning stoma      | 2 (3.0%)      | 1 (3.4%)      | 1 (2.6%)          |
| Laparoscopic ileocaecal resection | 1 (1.5%) | 0 (0.0%) | 1 (2.6%) |
| **Urology**              |               |               |                   |
| TURBT                    | 1 (1.5%)      | 1 (3.4%)      | 0 (0.0%)          |
| **Comorbidities**        |               |               |                   |
| Diabetes                 | 17 (25.4%)    | 8 (27.6%)     | 9 (23.7%)         |
| Ischaemic heart disease  | 24 (35.8%)    | 11 (37.9%)    | 13 (34.2%)        |
| Heart failure            | 8 (11.9%)     | 3 (7.7%)      | 5 (13.2%)         |
| CKD stage 3 and above    | 16 (23.9%)    | 2 (6.9%)      | 14 (36.8%)        |
| Hypertension             | 45 (67.2%)    | 22 (75.9%)    | 23 (60.5%)        |
| Dementia                 | 5 (7.5%)      | 3 (10.3%)     | 2 (5.3%)          |
| Chronic obstructive pulmonary disease | 8 (11.9%) | 3 (10.3%) | 5 (13.2%) |
| Stroke/transient ischaemic attack | 7 (10.4%) | 3 (10.3%) | 4 (10.5%) |
| Venous thromboembolism   | 4 (6.0%)      | 2 (6.9%)      | 2 (5.3%)          |
| Cancer                   | 11 (16.4%)    | 2 (6.9%)      | 9 (23.7%)         |
| Peripheral vascular disease | 3 (4.5%)     | 1 (3.4%)      | 2 (5.3%)          |
| Mental health disorder   | 6 (9.0%)      | 3 (10.3%)     | 3 (7.9%)          |
| Atrial fibrillation/flutter | 4 (6.0%)     | 1 (3.4%)      | 3 (7.9%)          |
| Obstructive sleep apnoea | 2 (3.0%)      | 0 (0.0%)      | 2 (5.3%)          |
| Rheumatoid arthritis     | 2 (3.0%)      | 1 (3.4%)      | 1 (2.6%)          |
| Parkinson’s disease      | 1 (1.5%)      | 0 (0.0%)      | 1 (2.6%)          |
| **Sensory impairment**   |               |               |                   |
| Hearing impairment       | 22 (32.8%)    | 5 (17.2%)     | 17 (44.7%)        |
| Visual impairment        | 25 (37.8%)    | 10 (34.5%)    | 15 (39.5%)        |
| **Cognitive assessment** |               |               |                   |
| Abnormal 6-CIT/T-MoCA score | 24 (35.8%) | 12 (41.4%) | 12 (31.6%) |
| Median 6-CIT (IQR)       | 2 (0–4)       | –             | –                 |
| Median T-MoCA (IQR)      | 18 (15–19)    | –             | –                 |
| **CFS score**            |               |               |                   |
| Median (IQR)             | 4 (3–5)       | 4 (3–5)       | 4 (3–5)           |

*AAA = abdominal aortic aneurysm. *EVAR = endovascular aneurysm repair.

Results

Description and development of the clinic

Description of the clinic

Sixty-seven patients were referred to the service during the study period, 50.7% (n = 34) from other hospitals. All accepted a virtual consultation: video 43.3% (n = 29), telephone 56.7% (n = 38). Baseline demographics were similar between the two consultation modalities (Table 1).

The non-attendance rate was 1.5%, compared with 1.7% for 8 weeks of face-to-face clinic pre-pandemic. Seven video consultations were switched to telephone. Reasons included: insufficient bandwidth (n = 3), patient’s camera not working (n = 2), difficulty logging on to Attend Anywhere (n = 1) and one reason unclear.

Mean consultation time was telephone: 47 min (SD 13), video: 44 min (SD 12). Interventions made as a result of the assessment are shown in Supplementary Figure 1 available in Age and Ageing online.

Development of the clinic

Three PDSA cycles tailored the service to virtual working (Supplementary Table 1 available in Age and Ageing online). The resulting clinic outline is presented in Table 2.

Patient survey results

The survey had 53 respondents (79.1%; 23 video, 30 telephone consultations). Severe hearing impairment was reported by 18 patients (34.0%; 7/23 video, 11/30
Table 2. Comparison of CGA domains in face-to-face clinic versus virtual clinic

| Domain                       | Face to face assessment | Virtual assessment | Example intervention |
|------------------------------|-------------------------|--------------------|----------------------|
| Comorbidity                  | Full history            | Full history       | Treatment optimisation as per organ specific guidance |
| Assessment of known comorbidities | Targeted history and screening tools, e.g. STOP-BANG score | Targeted history and screening tools, e.g. STOP-BANG score | Confirmatory investigations, e.g. sleep studies and consideration of preop non-invasive ventilation |
| Screening for undiagnosed comorbidities, e.g. OSA | Medication review - History - GP summary via email or network record (e.g. Connecting Care) | Medication review - History - GP summary via email or network record (e.g. Connecting Care) | Rationalisation, e.g. STOPP/START criteria |
|                              |                         |                    | Alteration perioperatively, e.g. diabetes regimen, anticoagulation as per national/local guidelines |
|                              |                         |                    | Dietician referral |
| Medication                   | Medication review - History - GP summary via email or network record (e.g. Connecting Care) | Medication review - History - GP summary via email or network record (e.g. Connecting Care) | Rationalisation, e.g. STOPP/START criteria |
| Nutrition                    | MUST score BMI | MUST score BMI (patient to measure own height and weight prior to appointment) | Brief advice to increase exercise, Occupational therapy/social work referral Postoperative functional decline risk counselling |
| Frailty                      | Edmonton frail scale    | Clinical frailty scale | Brief advice to increase exercise, Occupational therapy/social work referral Postoperative functional decline risk counselling |
| Cognition                    | Collateral history MOCA | 6-CIT (used 22/5/20–5/6/20) T-MOCA (used 5/6/20–17/7/20) | Assess capacity to consent to surgery Refer to memory services Postoperative delirium risk counselling |
| Smoking                      | Pack year history       | Pack year history | Smoking cessation advice & referrals Alcohol advice as per UK guidance (<14 units/week) |
| Alcohol                      | Document units/week     | Document units/week | If alcohol excess: intravenous B vitamins and monitor for withdrawal (e.g. CIWA) as per local policy |
| Social circumstances         | History: including ability to manage activities of daily living, social support network | History: including ability to manage activities of daily living, social support network | Occupational therapy/social work referral |
| Perioperative risk score      | Validated score, e.g. NSQIP/SORT | Validated score, e.g. NSQIP/SORT | Inform shared decision making discussion regarding risk/benefit of surgery |
| Investigation                 | Perform ECG in clinic    | Examine previous notes for recent ECG/request recent ECG from GP/perform in anaesthetic clinic | |
|                              | Phlebotomy/radiology    | Review previous hospital and primary care results. Liaise with anaesthetic clinic to request imaging (rarely required) and blood tests at face to face assessment |

aOSA = obstructive sleep apnoea. bMUST = Malnutrition Universal Screening Tool. cBMI = body mass index. dMOCA = Montreal Cognitive Assessment. e6-CIT = Six-Item Cognitive Impairment test. fT-MOCA = Telephone-Montreal Cognitive Assessment. gCIWA = Clinical Institute Withdrawal Assessment for Alcohol. hNSQIP = National Surgical Quality Improvement Programme. iSORT = Surgical Outcomes Risk Tool.

Telephone: 8 had severe visual impairment (15.0%; 2/23 video, 6/30 telephone).

Barriers to video consultation
Approximately half (52.2%) of respondents who participated in a video consultation required help accessing equipment—usually from family members; four (17.4%) experienced difficulties logging on to Attend Anywhere.

Of the 38 patients who requested telephone consultation, 60% cited reasons including: technical issues (n = 6); lack of digital literacy (n = 5); lack of equipment (n = 4); no internet access (n = 3); visual impairment (n = 3); convenience (n = 1); not receiving software link (n = 1).

Quality of the consultation
Technical Thirty-nine (73.6%) participants reported being able to hear and understand the clinician throughout the whole consultation, 24.5% most of the time. For video consultations, 60.9% (n = 14) could see the doctor all of the time, 13.0% most of the time, 8.7% less than half of the time and 4.3% not at all. Of those that reported any shortfall in being able to hear or understand the clinician, 24% had hearing impairment, and 23% visual impairment.

Effectiveness Forty-eight (90.6%) participants reported understanding the reason for the consultation and felt better able to manage and understand their condition. Fifty-one (96.2%) either agreed or strongly agreed with the
statement ‘I was given adequate opportunity to express my opinion and ask questions during the consultation’. Over half (54.7%) of respondents rated the quality of the consultation as excellent; 32.1% very good; 9.4% good; 1.9% poor. Participant reported consultation understanding or quality was unaffected by sensory deficits.

Comparison with face-to-face consultations
Most patients (77.4%) found virtual consultations more convenient than face-to-face, and would prefer them in future—all the time 28.3%; most of the time 34.0%; half the time 18.9%. However, three patients commented that they would prefer face-to-face consultations if the content was ‘important’.

Most patients (62.3%) would have travelled by car if their appointment had been face-to-face (Supplementary Figure 2 available in Age and Ageing online). Three patients commented that virtual appointments were more convenient, with one stating ‘it was less stressful than driving and parking’.

Clinician feedback
The majority (89.7%) of video consultations were rated adequate to deliver preoperative assessment, medical optimisation, and shared decision-making, compared to 68.4% of telephone consultations.

Clinicians reported free text comments for 53 consultations. Thirteen related to barriers to adequate assessment including: need for examination (six telephone, two video), hearing impairment (three telephone, two video) and cognitive impairment (one video). Positive comments included ‘saved trip from Cornwall which patient reported would have been challenging and expensive'; 'gained all information and developed rapport'; 'face-to-face would have added very little'.

Discussion
Using PDSA methodology, we converted a face-to-face pre-operative geriatric medicine clinic to a virtual clinic during the COVID-19 pandemic. In presenting the clinic breakdown in domains of CGA, we have determined that the majority of assessment areas were met [7].

Virtual clinics are feasible in this perioperative setting. All patients were able to engage effectively in virtual consultation, including those with sensory impairment. This is contrary to concerns raised about older people’s ability to engage in virtual consultation due to lower internet usage, and higher prevalence of sensory and cognitive impairment [8,9]. Only five patients cited lack of digital literacy as the barrier to video consultation. Only seven patients lacked necessary equipment or internet access. Many patients required setup assistance; we did not capture the nature of this help, nor whether it may have caused additional exposure to COVID-19 from a person outside their household.

Virtual consultations were acceptable to patients, demonstrated by 86.8% of patients rating the consultation as excellent or very good, with similar ratings for video and telephone. Physicians however preferred video consultation. Lack of physical examination, sensory and cognitive impairment were physician-reported challenges to adequate assessment.

There are several benefits to virtual preoperative assessment, with most patients finding it more convenient than face-to-face review. This is significant in a perioperative pathway which involves multiple specialists generating multiple appointments, which older people may find burdensome [10]. Secondly, fewer hospital visits may reduce exposure to nosocomial COVID-19 [11]. Thirdly, most would have travelled by car or hospital transport to a face-to-face consultation, thus the virtual option reduced pressure on hospital resources, saved patients’ money, and reduced carbon emissions.

This study has several limitations. It was conducted in a single centre with an established perioperative pathway for older patients limiting the generalisability of the results. Potentially useful outcome measures that were not captured included: administrative time to manage virtual consultations, time taken for face-to-face consultations, and whether patients had prior experience of virtual clinics. Furthermore, clinician satisfaction may have been altered by ‘safety-netting’, given the patient still attended a face-to-face anaesthetist-led clinic, where clinical examination and investigations could be performed. Finally, responses may have been influenced by the concern of nosocomial COVID-19 during hospital visits, rendering the favourable findings subject to unconscious bias.

Conclusion
This is the first study of virtual preoperative medical assessment for older people. We demonstrated acceptability and feasibility in delivering virtual comprehensive medical assessment within our local perioperative pathway. Future studies should examine methods of converting the whole preoperative pathway to virtual assessment, with comparison to face-to-face consultations to identify patient groups that would benefit most.

Supplementary Data: Supplementary data mentioned in the text are available to subscribers in Age and Ageing online.

Declaration of Conflicts of Interest: None.

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