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# BMJ Open

## How can we improve Comprehensive Geriatric Assessment for older people living with frailty in primary care and community settings? A Qualitative Study

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4 **1 How can we improve Comprehensive Geriatric Assessment for older people living**  
5  
6 **2 with frailty in primary care and community settings? A Qualitative Study**  
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8  
9

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30  
31 **Abstract**  
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35 **Objective**  
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37 With advancing age comes the increasing prevalence of frailty and increased risk of adverse  
38 outcomes (e.g. hospitalisation). Comprehensive Geriatric Assessment (CGA) is a multi-dimensional  
39 holistic assessment that includes physical, cognition and psychosocial components. International  
40 evidence shows positive outcomes from CGA use in the community. This study aimed to explore how  
41 to improve the current CGA, and the factors needed to implement it in the community in England.  
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49 **Design**  
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51 A qualitative interview study with older people over 75 years and health care professionals. Data  
52 were analysed using an abductive analysis approach.  
53

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55  
56 **Setting**  
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58 England, United Kingdom  
59  
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## 23 **Results**

24 Twenty-seven people were interviewed, constituting 14 older people and 13 healthcare  
25 professionals (HCPs). We identified limitations in the current CGA: a lack of information sharing  
26 between different healthcare professionals who deliver CGA; poor communication between older  
27 people and their HCPs; and a lack of follow-up as part of CGA. When we discussed the potential for  
28 CGA to utilise technology, HCPs and older people varied in their readiness to engage with it.

## 29 **Conclusions**

30 Viable solutions to address gaps in the current delivery of CGA include the provision of training and  
31 support to use digital technology and a designated comprehensive care coordinator. The next stage  
32 of this research will use these findings, existing evidence and stakeholder engagement, to develop  
33 and refine a model of community based CGA that can be assessed for feasibility and acceptability.

## 34 **Keywords**

35 Ageing, comprehensive geriatric assessment, digital technology, frailty, qualitative.

## 36 **Strengths and Limitations**

- 37 • Use of qualitative interviews enabled rich data on exploration and synthesis of older people  
38 and healthcare professionals.
- 39 • Our theoretically informed qualitative research and stakeholder insights identified both  
40 challenges to the current delivery of CGA as well as opportunities for the improvement of  
41 CGA for older people with frailty.
- 42 • Our study is deliberately exploratory; thus the findings may not be transferable to other  
43 older and healthcare professionals. However, we recruited older people with frailty and  
44 HCPs with a wide variety of views and experiences.

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## 45 Introduction

46 Between 2020 and 2050 the number of people aged over 80 will triple to reach 426 million (1). With  
47 ageing, people are more susceptible to develop multiple, complex conditions that reduce their  
48 independence and quality of life (1-4). This is due to underlying factors, such as falls, frailty, and  
49 delirium (1, 3).

50 Frailty is a clinical syndrome where multiple body systems deteriorate leading to increased  
51 vulnerability (3, 5). Frailty increases the risk of falls, disability, hospitalisation, mortality, and contact  
52 with healthcare services (5, 6). Prevention and reversal of frailty can enable people to stay well and  
53 live independently for longer (3). Frailty affects half of the UK population aged over 85 and costs the  
54 NHS £5.8 billion per year (6). Older people with frailty need robust interventions that respond to the  
55 complexity of their condition (3, 7). Comprehensive Geriatric Assessment (CGA) delivered in acute,  
56 primary and community settings aims to prevent deterioration and complications associated with  
57 frailty (3, 8). CGA is a multi-dimensional diagnostic and therapeutic intervention that includes a  
58 comprehensive assessment of physical, cognitive and psychosocial components with the  
59 development of a holistic management plan in partnership with the older person with frailty (7).  
60 Evidence for the effectiveness of CGA for older people with frailty in community from recent  
61 systematic reviews is mixed (7, 9, 10). Ho et al reported benefits in terms of the likelihood of living at  
62 home, reduced mortality, improved cognition, and activities of daily living, but with uncertain  
63 benefits on quality of life (10). Whereas Briggs and colleagues found no difference in mortality,  
64 activities of daily living, quality of life and care home admissions (7).

65 A key priority of the National Health Service (NHS) in the UK is to support older people with frailty in  
66 managing their long-term conditions (3, 11). Regardless of the complexity and diversity of the needs  
67 of older people with frailty, some are facing inequity in access to interventions which, if accessed,  
68 may help to maintain their independence (3). Thus, there is a need to ensure that CGA best meets  
69 the needs of all older people living with frailty, without compromising safety and efficacy.

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3 70 Recent NHS initiatives to strengthen the efficiency of outpatient services using non-face-to-face  
4  
5 71 approaches require consideration. For example, there is growing interest in the use of wearable  
6  
7 72 devices to monitor patients (11). The NHS Long Term Plan and Digital Transformation Plan  
8  
9 73 recommend the use of digital equipment in the assessment and monitoring of older people with  
10  
11 74 frailty; with the option of using wearable devices to ensure services are inclusive and available to all  
12  
13  
14 75 (11, 12).

16  
17 76 Improving the effectiveness and efficiency of CGA (10) requires exploration of how individual  
18  
19 77 components may work and how the overall intervention can be enhanced. The Digital and Remote  
20  
21 78 Enhancement for the Assessment and Management of Older People with Frailty (DREAM) project  
22  
23 79 aimed to develop a model for CGA that utilised digital technology. This qualitative paper explores  
24  
25 80 the factors for enhancing CGA in community settings.

## 29 81 **Methods**

### 32 82 **Design**

33  
34  
35 83 A qualitative interview study with older people and health care professionals. AM collected and  
36  
37 84 analysed the data in collaboration with VG and JF. AM, VG and JF are experienced qualitative  
38  
39 85 researchers from different professionals backgrounds (physiotherapist, pharmacist and nurse).  
40  
41 86 Ethical approval was issued by the University of Exeter, College of Medicine and Health Research  
42  
43 87 Ethics Committee (Ref 509407). The study has been reported according to the Consolidated Criteria  
44  
45 88 for Reporting Qualitative Study (COREQ) guidelines (13).  
46  
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49 89

### 52 90 **Stakeholder engagement**

53  
54 91 Patient Public Involvement and Engagement (PPIE) representatives and Health and Care Professional  
55  
56 92 (HCP) stakeholders contributed to the development, design and conduct of this research. They  
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93 contributed to developing and piloting topic guides for the interviews and provided analytical insight  
94 into preliminary findings.

### 95 **Sampling and Recruitment**

96 We employed a maximum variation sampling strategy (14) to capture diversity in gender, ethnicity,  
97 living circumstances, socioeconomic factors, geography, frailty, sensory (e.g. visual or hearing  
98 problems), and memory problems of older people with frailty. For healthcare professionals, we also  
99 used a maximum variation sampling strategy (14), to ensure representation of professional  
100 background, geographical location, and gender.

101 We invited 132 community-dwelling older people, who had participated in either the Community  
102 Ageing Research (CARE) 75+ (15) or the Oxford Pain Activity and Lifestyle (OPAL) (16) cohort studies,  
103 to be interviewed. Both CARE 75+ and OPAL cohorts provide older people who were representative  
104 and diverse geographical, ethnic backgrounds. We invited health and social care professionals  
105 working in non-hospital settings in the UK working with older people living with frailty via social  
106 media (Twitter and Facebook) and via professional networks. AM had no previous contact with any  
107 of the participants. The interviews were conducted face-to-face, via telephone or video call,  
108 depending on the participants' preference (14).

### 109 **Data collection**

110 We developed semi-structured topic guides (14, 17) for older people (Additional file 1) and HCPs  
111 (Additional file 2) based on a review of literature, discussions with our older people and family  
112 members, and HCP stakeholders. Topic domains were aligned to the Non-adoption, Abandonment,  
113 Scale up, Spread and Sustainability (NASSS) framework to ensure collection of rich data (18) to  
114 explicitly focus our analysis on how best to improve CGA (18). AM piloted the topic guide with  
115 stakeholders and refined one question (concerning outcomes to be measured) for clarity. The topic  
116 guide enabled consistency in the data collection, with the interviews flexible enough to allow the  
117 participants to explain what was important to them (19). The audio-recorded interviews were



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118 transcribed by a GDPR compliant transcriber and checked for accuracy by AM. Fieldnotes captured  
119 the context of the interview.

## 120 **Data analysis**

121 We undertook abductive analysis (20), and used NVivo (Release 1.7) (21) to manage the data. This  
122 involved an iterative approach to analysis, to facilitate understanding (19, 22). We coded the  
123 interviews in cycles, with deductive codes from the literature and inductive codes generated by AM,  
124 identifying similar ideas or concepts that could be categorised into a code (19, 23). This enabled  
125 balance between data relating to pre-existing concepts and data based on the perspectives of the  
126 participants (20, 24). We (AM, VG and JF) then developed a conceptual map of the different  
127 participants' perspectives (17) before we further categorised the codes using the NASSS framework,  
128 and the Theoretical Framework of Acceptability (18, 25), which allowed us to explain complexity  
129 within the domains of an intended intervention: CGA that utilises technology. We used the  
130 conceptual map to create a hypothetical case (vignette) of an older person who participated in a  
131 CGA that used technology (26). We used the vignette in the final three interviews with HCPs, to  
132 extend our understanding of the potential afforded by technology.

## 133 **Results**

134 Interviews took place between May and December 2022.

### 135 **Older people**

136 Fourteen older people consented to participate and were interviewed. Respondents were aged  
137 between 75 and 90 years old, were evenly split between males and females, and included  
138 participants with hearing and/or visual impairment, mobility impairments, and with one or more  
139 long term condition. One participant asked to be interviewed in the presence of their carer (a  
140 spouse). The interviews lasted between 16 and 92 minutes . (Table 1).

141 *Table 1 Demographic characteristics of older people with frailty*

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Participant Pseudonym	Gender	Age	Current residence in England	Living circumstances	Mode of interview
Robert	Male	84	North East	Live alone	Telephone interview
James	Male	83	South West	Live alone	In-person interview
Richard	Male	82	South West	Live with spouse	Online audio call
William	Male	90	North East	Live with spouse	Online video call
Barbara	Female	82	North East	Live with spouse	Telephone interview
Gary	Male	76	North East	Live with spouse	Telephone interview
Karen	Female	79	South East	Live alone	Online video call
Steven	Male	75	South East	Live with spouse	Telephone interview
Shirley	Female	79	Midlands	Live alone	Telephone interview
Frances	Female	89	South East	Live alone	Telephone interview
Carol	Female	82	North West	Live alone	Telephone interview
Donna	Female	85	South East	Live alone	Telephone interview
Frank	Male	80	Midlands	Live with spouse	Telephone interview
Lois	Female	86	South West	Live with spouse	Telephone interview

142

### 143 **Healthcare professionals**

144 The thirteen HCPs came from different professional backgrounds, and from different geographical  
 145 areas of England. All of the participants were working, or had worked, with older people with frailty,

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146 for a duration of two to 30 years (Table 2). The interview duration ranged between 33 and 160  
 147 minutes .

148 *Table 2 Demographic characteristics for HCPs who participated in the study*

Participant number	Profession	Years of providing care to older people	Location in England	Gender	Mode of interview
HP1	Frailty assistant practitioner	20	South West	Female	Online
HP2	Nurse	15	South West	Male	Online
HP3	GP	Retired	North East	Female	Online
HP4	Physiotherapist	19	South West	Female	Online
HP5	GP	16	South West	Female	Online
HP6	Physiotherapist	30	South West	Female	Online
HP7	Nurse	15	South West	Female	Online
HP8	Nurse	2	South East	Female	Online
HP9	Occupational therapist	10	South East	Female	Online
HP10	Consultant Geriatrician	23	North West	Male	Online
HP11	Consultant Geriatrician	19	Midlands	Female	Online
HP12	Physiotherapist	4	Midlands	Female	Online

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HP13	Pharmacist	3	North West	Female	Online
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149

(18, 25) Here we present the four domains that were most important for both the patient and professional participants: frailty (the condition), intended adopters (both professional and lay), organisational factors (such as workforce challenges), and acceptability (of aspects of technology and assessment).

### 154 **Frailty**

155 Amongst HCPs, there was an appreciation of the complexity of frailty as a condition. Regardless of  
156 whether they have an acute condition or not, all older people with frailty have complex needs due to  
157 having multiple long-term conditions, impairments and/or socioeconomic factors:

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158 *“Most of them are aged 80 almost all of them are frail and so they have multiple chronic*  
159 *conditions, they have got polypharmacy they tend to need some help with one or more*  
160 *activities of daily living”.* (HP13, Pharmacist)

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161 HCPs from different professions tend to provide a comprehensive assessment that involves physical,  
162 psychological and social needs for older people with acute and non-acute conditions. However,  
163 there is a need to provide older frail people with assessment prior to a crisis developing:

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164 *“All the domains yeah, the psychological, physical all those you know functional,*  
165 *environmental you know do you live in a house, a flat, bungalow, do you sleep upstairs, any*  
166 *falls you know any equipment in the toilet, that kind of thing and social you know do you*  
167 *get out.”* (HP12, Physiotherapist)

168 *“So, if you’re trying to keep somebody weller for longer, then any of those proactive*  
169 *interventions rather than waiting until they get to crisis point.”* (HP9, Occupational  
170 *therapist)*

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171 We interviewed older people with frailty who were socioeconomically disadvantaged and/or  
172 experienced sensory or physical impairment that can exacerbate the complexity of their condition.

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3 173 For example, Carol had financial challenges, restricted mobility, visual impairment, multiple long-  
4  
5 174 term conditions, and a high risk of falling. Carol had limited choices in access to care, because of her  
6  
7 175 restricted ability to travel to appointments, lack of a support network, and no access to technology:  
8  
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10

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11  
12 176 *“I’ve been a single person all my life and I get the basic state pension. So, I’ve never ever*  
13 *been able to afford the technology that people use every day to day in these days and*  
14 *that’s the reason I don’t have it.” (Carol, 82 years old)*  
15  
16

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17  
18 179 In contrast, Karen lived alone, but has regular communication with family and friends. During her  
19  
20 180 health and care journey, Karen was able to enact her own health decisions and avoided long NHS  
21  
22 181 waiting time for tests and referrals:  
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26  
27 182 *“I only saw the consultant yesterday, so the next steps haven’t been put in place yet.*  
28 *Unfortunately, I have had to pay privately for it and the NHS seems to be in such a mess*  
29 *and the doctor did want to send me off for tests but she couldn’t justify so, more or less*  
30 *saying well you know it is as it is we can’t do anything more for you because we haven’t got*  
31 *proof that this test or that test is something we can do, something we can justify. [...] I’ll*  
32 *have to pay for that privately otherwise I will just be waiting too long. You know I am*  
33 *getting on I don’t want the last two or three years probably of my life to be sitting around*  
34 *at home feeling sorry for myself.” (Karen, 79 years old)*  
35  
36

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### 37 38 190 **Intended adopters**

39  
40 191 Some HCPs indicated that an HCPs occupational background may inform the scope of assessment  
41  
42 192 during the CGA, and the quality of the CGA that they offer. A nurse who led a frailty team showed  
43  
44 193 appreciation of the range of HCP backgrounds in their team, which enabled them to involve the  
45  
46 194 most suitable HCP (e.g. in terms of their skill set), to meet the unique needs of the older person:  
47  
48  
49  
50

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51  
52 195 *“obviously if it was things like their ability to perform their physical activity to daily living*  
53 *that maybe something that I would involve one of, I’ve got a colleague who is Band 4*  
54 *assistant practitioner whose got a therapy background she’s very good at looking at the*  
55 *nuts and bolts of how people physically manage [...] I will also do joint visits with OTs and*  
56 *physios if we’re feeling that we need to, that there’s a, that the referral makes it sound like*  
57 *this is very much that mixed picture of it’s not just a medical requirement or a strict nursing*  
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201 *requirement that there's an overlap with where my therapy colleagues would come in".*  
 202 *(HP2, Nurse)*

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203 This contrasted with the view of a consultant geriatrician (HP11) who also led a frailty team. HP11  
 204 indicated that regardless of the different backgrounds of HCPs in their team, there should be no  
 205 differences in the CGA that they provide to older people with frailty. However, HP11 highlighted that  
 206 some professions may have limited ability to understand the complexity of older people's condition.  
 207 This was congruent with the views from older people who thought that their condition could be  
 208 managed better by an HCP with knowledge and experience of older people with frailty:

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209 *"They all do the same because they've all had their advanced [...], course the advanced*  
 210 *assessment healthcare assessment course. They've all done the same course ok,". (HP11,*  
 211 *Consultant Geriatrician)*

---

212 *"You could have one doctor who is in the practice who specialised in old people you know*  
 213 *just for the aged to sort of he specialised in the aged. [...] where old people could feel they*  
 214 *could go [...] rather than a general practitioner maybe somebody that was for the old and*  
 215 *the frail." (Barbara, 82 years old)*

---

216 In contrast, a GP (HP3) thought that the ability to deliver CGA depends upon the investigative and  
 217 communication skills, and previous experience of staff, and it is not restricted to a particular  
 218 background:

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219 *"So, I tend to work on a concept that I don't like thinking about professions doing things I*  
 220 *like to think about competencies." (HP3, GP)*

---

221 Some HCPs suggested that HCPs may require training to improve interpersonal skills, in terms of  
 222 communication and attention to detail, to ensure enhancement of CGA. For example, HP12 (a  
 223 Physiotherapist) shared their personal experience of developing their investigational skills when  
 224 providing remote CGA over time. HP7 (a Nurse) shared their experience of supporting new HCPs in  
 225 their team to learn how to pick-up non-verbal cues during home visits, to support identifying care  
 226 needs and provide CGA.

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227 **Organisation**

228 Interviewing HCPs from different geographical areas of England allowed us to explore organisational  
229 limitations, which would require innovation to increase readiness for new forms of technology-  
230 informed care delivery.

231 Some HCPs made references to fear and resistance to trying new ways of care delivery. For example,  
232 a nurse (HP2) referred to themselves as ‘a dinosaur’ when it comes to trying new technologies.

233 Similarly, a frailty assistant practitioner (HP1) also indicated that practitioners may need support  
234 from colleagues, while a consultant geriatrician (HP11) shared the challenges they had when using  
235 technology and the time needed for training to use new technology:

---

236 *“There’s also the training aspect of it training takes a long time you go in and sit down and*  
237 *have training whatever new technology comes you have to find time to go for training and*  
238 *you actually don’t get to understand its use until you start using it and the problems that*  
239 *you get when you start using it”. (HP11, Consultant Geriatrician)*

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240 Almost all HCPs discussed the negative impact of using different clinical databases in various settings  
241 on their ability to share and/or access patients’ records. HCPs discussed the importance of having a  
242 well-established information sharing process between HCPs in different settings in enhancement of  
243 CGA. HCPs shared their experiences of meeting the challenges in information sharing. For example,  
244 sharing data in regular Multi-Disciplinary Team (MDT) meetings, provides access to the GP medical  
245 records for HCPs who work in the community, which enables them to effectively support the older  
246 people with whom they work. Some organisations have a sharing document that all HCPs involved in  
247 CGA can use to input and share data, which staff found beneficial in terms of the availability of  
248 information and efficiency in obtaining key information when needed:

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249 *“I’ve not seen they’ve had a CGA, their clinical frailty scale is this, blah, blah, blah never*  
250 *seen it never ever. Never ever, ever seen it. So, information is not coming it is not flowing”.*  
251 *(HP12, Physiotherapist)*

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252 *“I just from previous experience I knew these sorts of things I needed to have so I made*  
 253 *sure that I discussed it with the CGG and got them to put this in place because I didn't want*  
 254 *to be spending exactly like the nurse, two hours, trying to get information when in five*  
 255 *minutes I can have that information.” (HP10, Consultant Geriatrician)*

256 *“So, for me to be able to know what medicines somebody is on, I have to have access to*  
 257 *that or I've got ask somebody who has access to check for me ok”. (HP11, Consultant*  
 258 *Geriatrician)*

259 Lack of staff capacity was perceived as a limitation for delivering CGA by all HCPs, which may inhibit  
 260 delivery of timely support which an older people may require. Some older people recognised the  
 261 limited staff availability and the increasing demands on the GP practices that inhibit continuity in  
 262 care. For them, lack of continuity decreases their engagement with their care:

263 *“More of us, more availability [...] I mean we are running its sort of like a virtual ward model*  
 264 *but it's going to be, we have less staff on at a weekend. So, our capacity to take new*  
 265 *referrals on a Friday and over the weekend is a lot less.” (HP9, Occupational therapist)*

266 *““When you see the doctor, you know you barely it's a locum that I see I don't see my own*  
 267 *doctor.”.” (Shirley, 79 years old)*

268 In contrast, other older people with frailty understood the current workforce challenges in the NHS  
 269 and suggested that improved communication between HCPs and sharing information may mitigate  
 270 the current lack of continuity:

271 *“GPs talk to each other and that you know if you go in and you see somebody who is not*  
 272 *your designated GP you know that fine well that the notes are there [...]. So, you feel*  
 273 *perfectly happy that you know whoever you are seeing, knows what they are talking*  
 274 *about.” (Lois, 86 years old)*

275 However, we identified that when an older person can identify a key contact person to support  
 276 them, this can mitigate a lack of continuity in their care, because they key person can co-ordinate  
 277 their care and ensure the continuous flow of communication:



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278 *“So, I sort of stayed involved in this case as a coordinating factor because you know it*  
279 *happens when too many people are involved things the outcome might not be good or the*  
280 *people can get lost in translation and so I managed to speak to the mental health team and*  
281 *everything and draw all the people that the GP had referred to, to a point where I said now,*  
282 *you need to take this forward.” (HP12, Physiotherapist)*

### 283 **Acceptability**

284 We identified elements that might influence acceptability by older people with frailty, that should be  
285 taken into consideration when enhancing CGA.

286 Although HCPs perceived that older people were satisfied with CGA and the care provided to them,  
287 some older people indicated that they could not freely communicate with HCPs and express their  
288 needs, because of perceived short appointments with their GP. Furthermore, older people lacked  
289 trust in their HCPs, or the clinical decisions made about their treatment plan:

290 *“I would say the consistent feedback is normally that we that they’re greatly relieved that*  
291 *we’ve given the time ‘cos we don’t time specify our visits” (HP2, Nurse)*

292 *“No, it’s so quick and it’s so, I mean in person, well I wouldn’t say personal you know when*  
293 *you speak to a doctor like I did with my old doctor if he, it was just a different attitude*  
294 *towards you, it’s like a conveyor belt, you come in, you go out, you come in and you go out*  
295 *so, you know you just feel it’s not the same what it was before.” (Shirley, 79 years old)*

296 Moreover, HCPs acknowledged the variation in older people readiness to engage with new ways of  
297 care delivery:

298 *“There is a high risk of inequalities because anytime you are going introduce something*  
299 *different new, there are going to be people who can use it very easily and there are going*  
300 *to be those who can’t for whatever reasons”. (HP13, Pharmacist)*

301 This aligned with the findings from interviews with the older people themselves. For example, Karen  
302 showed readiness to engage with new ways of receiving technology-informed care because she had

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303 previous experience of using technology in her healthcare, and in communication with family  
304 members. In contrast, Shirley rejected engagement with new forms of remote appointments:

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305 *“They did ask me once yes, but I said, well, I don’t know how to do it, let’s put it that way a*  
306 *video appointment I mean I don’t [...] I have a mobile phone so, you know I just don’t know*  
307 *how to do it. So, the other solution was that they speak to me over the phone”. (Shirley, 79*  
308 *years old)*

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309 Lack of physical access to technology (e.g. a device or internet connection) can inhibit an older  
310 person's opportunity to learn how to use technology, which may subsequently limit their readiness  
311 to engage with new forms of technology informed care. Therefore, those with frailty may require  
312 additional support to engage with CGA that utilises technology. For example, older people with  
313 sensory impairment may require specialist adaptation to their device, or support from a carer to  
314 engage; whereas older people who are already digitally literate may only need educational input on  
315 how to use a new technology.

316 HCPs recognised the variation in the needs and preferences of older people with frailty and  
317 discussed how they tailor CGA to the person’s needs:

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318 *“I would say we’re able to be very person-centred we’re not looking at things from a*  
319 *clinician’s perspective only we will explore things from the patient’s perspective in terms of*  
320 *what they think is their problems.” (HP4, Physiotherapist)*

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321 Some HCPs thought that the presence of a carer, a family member or support network may increase  
322 a frail older person's acceptance of CGA that utilises technology. However, HCPs acknowledged the  
323 higher demands on the carer which may reduce the support they can provide, to help the older adult  
324 engage with technology. A GP (HP3) shared examples of caregivers who inadvertently disempower  
325 the older person, in terms of decision-making about their healthcare choices. Older people may  
326 therefore require support from a wider network, and not only their carer:

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327 *“Some of them have families who help them but they still like you know eye contact,*  
328 *physical contact and the written word, you know paper, hard copy of anything. So, I am*  
329 *afraid that’s something that they’ll eventually all pop off but and thankfully the younger*  
330 *ones are you know quite capable of using all these devices.” (Barbara, 82 years old)*

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331

332 HCPs may not be able to provide the required follow-up after an assessment, important for tracking  
333 the referrals to other services if needed and the management plan provided to the patient. Similarly,  
334 older people explained the challenges that they were facing in following-up the HCPs; for example,  
335 to find out the result of a test, or to book an appointment:

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336 *“I would like to think we’re good at going out and identifying the problem we’re good at*  
337 *negotiating a management plan with someone it’s then how do you monitor the effect of*  
338 *that management plan”. (HP2, Nurse)*

339 *“I had to phone my practice after I’d been to see the 111 doctor and she said get in touch*  
340 *with your practice and I got this sort of non-committal reply oh, well you’d better start your*  
341 *antibiotics and I was quite disappointed that they didn’t get in touch with me because*  
342 *they’d given me that advice without having seen a report and I thought well I would have*  
343 *expected something to come back but like I said, I was really not well enough to do*  
344 *anything about it”. (Donna, 85 years old)*

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## 345 Discussion

346 In this study, we identified key challenges to the enhancement of CGA in the community, including:  
347 information sharing between different HCPs who are delivering the CGA; communication between  
348 older people and their HCPs; and follow-up appointments after conducting the CGA. From the  
349 current challenges that were explained by participants, and suggestions which they made to address  
350 them, we identified factors to enhance CGA in the community.

351 Both HCPs and older people considered that the delivery of CGA should not be limited to those from  
352 specific professions but should be based upon a HCPs competency and knowledge of the complexity  
353 of need for older people with frailty. This finding aligns with the Ageing Well Network of Enhanced

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3 354 Care for older People (EnCOP) competency framework (27); an aim of which is to enhance staff  
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5 355 competency in working anywhere in the care system (27). The Health Education England and NHS  
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7 356 England commissioned the Frailty Core Capabilities Framework in 2018 to identify skills and  
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10 357 behaviours required to deliver high quality of care to older people with frailty (28). However, there is  
11  
12 358 limited use of the framework in commissioning education or training, reflected in the results of  
13  
14 359 evaluation surveys that were conducted in 2018 and 2019 (29). We suggest that upskilling staff and  
15  
16 360 providing them with appropriate training to improve their communication and investigation skills  
17  
18 361 may be a viable solution to mitigate the negative impact of workforce shortages on the effectiveness  
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21 362 of CGA.

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24 363 From conducting interviews and workshops with stakeholders, we identified the need for assigning a  
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26 364 member of staff or MDT team to a co-ordinating role, which we designated as “Comprehensive Care  
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28 365 Coordinator”. This person could coordinate the delivery of CGA by facilitating information sharing  
29  
30 366 between different HCPs, communicating with older people with frailty on a regular basis, and  
31  
32 367 ensuring that the management plan including referrals is acted upon. Designating a care coordinator  
33  
34 368 may improve continuity of care with one point of contact and provide reassurance through a  
35  
36 369 therapeutic, long-term relationship. This may provide reassurance to the older person and ensure  
37  
38 370 effective follow-up of any management plan. Care coordinator roles in the community, including  
39  
40 371 case managers, may reduce emergencies. However, evidence shows variation in the role in different  
41  
42 372 studies in terms of duration and frequency of home visits and HCPs who coordinated the care (10,  
43  
44 373 30, 31). Further research needs to identify who could best coordinate care in older people and what  
45  
46 374 the best approach may be.

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51 375 Moreover, HCPs agreed that utilising technology in the delivery of CGA may enable HCPs to provide  
52  
53 376 support for older people without compromising their follow-up. The NHS plan highlighted the need  
54  
55 377 for enhancing the use of technology in healthcare, to change how care is being provided to patients;  
56  
57 378 and to create joined up computer systems that give staff sufficient access to data, to provide  
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3 379 improved care for patients (11). However, there is a need for digital upskilling of staff to support  
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5 380 their effective use of technology in healthcare (32).  
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8 381 Different IT-systems and a lack of information governance arrangements across different settings  
9  
10 382 currently inhibits information sharing and creates tension between HCPs in different settings. HCPs  
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12 383 told us that the lack of connection between different systems must be addressed, if they are to  
13  
14 384 deliver an effective CGA. Similarly, older people mentioned how lack of access to information  
15  
16 385 magnified unequal access to effective CGA, and support and care for older people with frailty. In  
17  
18 386 February 2023, NHS Digital became responsible for digital technology, data and health and care  
19  
20 387 delivery. This has the potential to address some of the challenges in information sharing (12).  
21  
22 388 Existing research has identified the need for convenient platforms and improved digital records for  
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24 389 integrated care services for older people (including CGA) that maintain privacy and security when  
25  
26 390 sharing patient data between MDTs (32, 33). Such integrated platforms may enhance  
27  
28 391 communication and coordination of care (32, 33). However, resolving existing operational  
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30 392 complexities is likely to require additional funding and the creation of interoperable IT-systems (11,  
31  
32 393 12, 32, 34).  
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38 394 We found that socioeconomic factors, including living circumstances, income, and social network  
39  
40 395 impacted older peoples' treatment choices; in terms of whether they visited a clinical specialist and  
41  
42 396 waiting times for NHS appointments. This implies that when developing the CGA that utilises  
43  
44 397 technology we need to consider how to mitigate socioeconomic factors that inhibit access and  
45  
46 398 capacity to obtain the benefits of using digital equipment in the assessment and follow-up. Existing  
47  
48 399 research suggests that digital interventions are less effective in populations with socioeconomic  
49  
50 400 disadvantage compared with those with higher socioeconomic status (35). Although the COVID 19  
51  
52 401 pandemic accelerated the shift to online resources and services, and changed patient perceptions  
53  
54 402 and willingness to use technology, it increased digital inequalities (36, 37). Increasing physical access  
55  
56 403 to connected devices and the internet may not be enough to reduce inequalities in access to CGA  
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3 404 that utilises technology (35, 36, 38). Therefore, training and support would be needed to ensure  
4  
5 405 older people could be digitally enabled; however, this may not be appropriate for everyone, and  
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7 406 support would need to be individualised (39).  
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10 407 Using technology for monitoring and supporting older people with frailty is an NHS priority, and over  
11  
12 408 time there may be more opportunities for older people with frailty to access and use technology  
13  
14 409 (11). Research now needs to assess if these changes positively affect older people with frailty,  
15  
16 410 support engagement with CGA that utilises technology, and whether they diminish inequalities in  
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18 411 access to technology informed care.  
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22 412 Qualitative interviews enabled exploration and synthesis of older people and HCPs perspectives.  
23  
24 413 Although we recruited older people with frailty and HCPs with a wide variety of views and  
25  
26 414 experiences, our findings may not be transferable to older people and HCPs who have different  
27  
28 415 experiences or perspectives (e.g. we were unable to recruit any social workers despite employing  
29  
30 416 several strategies) (17, 19). However, our theoretically informed qualitative research and  
31  
32 417 stakeholder insights identified both challenges to the current delivery of CGA as well as  
33  
34 418 opportunities for the improvement of CGA for older people with frailty.  
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## 39 **Conclusions**

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42 420 We identified four factors to enable implementation of CGA in community: enhancing staff  
43  
44 421 competency in working with older people with frailty, creating interoperable IT-systems, assigning a  
45  
46 422 care coordinator for older people with frailty, and mitigation of the impact of inequalities in access  
47  
48 423 to digital care. Introducing technology and a designated comprehensive care coordinator may be  
49  
50 424 vital to addressing gaps in the current provision of CGA. These solutions may also positively affect  
51  
52 425 the acceptability of CGA in older people with frailty. The next stage of this research will further  
53  
54 426 develop, refine and test a model of improved CGA in community setting.  
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## 530 Authors' Contributions

531 VG and JW conceived the ideas for the research with the help of JF and SL. AM collected the data.

532 AM, JF and VG analysed the data. AM led the writing with the help of JF and VG. NM, HL, SL and SC  
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## 539 Conflict of interests

540 None.

## 541 Ethics approval and consent to participate

542 All the participants gave written informed consent and consent to participate. Ethical approval was  
543 issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref  
544 509407).

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3 545 **Consent for publication**  
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6  
7 546 The participants gave their consent to participate in the study and to publish anonymised quotes  
8  
9 547 from the interview transcripts. The names of the participants have been anonymised.  
10

11  
12 548 **Availability of data and materials**  
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14

15  
16 549 Supplementary data mentioned in the text are available in the additional files.  
17

18  
19 550 **Additional files**  
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22 551 Additional file 1 contains topic guide for interviews with older people.  
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25 552 Additional file 2 contains topic guide for interviews with HCPs.  
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## Topic guide –Older people and carers

**Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.**

Topic	Prompts
<b>Background</b>	
Could you tell me a bit about yourself and what is important to you in your life /lives?	Who they are? Where they live? What do they do? Support networks
Does your health or personal situation impact on what is important to you?	How? why?)
<b>Appointments with health and care staff</b>	
Please can you think back to a recent appointment with a health or social care professional (such as a Dr or nurse), and tell me about what happened in that appointment	Thinking about things like asking questions, checking your ability to do something, or taking any measurements? Did you get the chance to say anything such as what is important to you
What did you think about how that appointment was conducted?	Whether they would have liked anything to have been done differently, or not done at all? what you would have liked to have happened? And why?
If an appointment went well, what were the things that were done, that made that a positive experience for you?	Anything that could have been done differently?
Are you able to give me any examples of how the pandemic has changed how you engage with health and care staff?	What has worked well for you? What hasn't worked so well?
<b>Thinking ahead</b>	
We are exploring different ways health and care professionals might conduct appointments with older people or find out about a person's health. I am going to ask you your thoughts about different ways they could do this: <ul style="list-style-type: none"> <li>• What do you think about appointments being done remotely; for example by telephone or video?</li> <li>• What do you think about using different ways of sharing information on their current health with staff; for example filling out questionnaires?</li> <li>• What do you think about using equipment that collects information about your health, for example taking your own blood pressure and sending results to your GP?</li> <li>• What do you think about using a mobile phone to share information about how you are doing; for example, a weekly phone check-in with health or care staff?</li> <li>• What do you think about using wearable technology, for example a pedometer or fitbit that collects data about your movement or exercise?</li> </ul>	What informs their thinking, any preferences, concerns or worries? Can you think of any other older people for whom these might not be appropriate, could they make things worse, What sort of problems may pose particular challenges? Could these be helpful or beneficial to older people? What might be needed to use effectively?
For those who might struggle with technologies, can you think of ways in which staff can best support them to ensure they can still access to the best possible care?	Who might struggle?
If we want to set up a new way of doing appointments using technology, what should we measure to see if the new way works?	

Is there something else that I have not asked you about, that you would like to tell me about your health and healthcare?

**Thank you.**

## Topic guide –Staff

**Researcher to introduce self, ask why participant interesting in taking part and orientate them as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.**

Topic	Prompts
<b>Background</b>	
Please can you tell me a bit about your professional background and current role?	How long and in what capacity have you been working with older people? Describe the setting you work in.
Please can you tell me a bit about the older people that you work with and the kinds of things that you do with them in consultations	Asking them questions, checking their ability to do something, or taking any measurements?; do you do things differently if they are acutely unwell vs proactive/preventative care; how do you tailor assessments and care to meet individual needs/what is important to them
<b>Current assessments</b>	
What do you think older people/carers think about what you assess and how you conduct assessments	Do you think that they might like anything to be done differently, or not done at all?
If a consultation goes particularly well, what is it that you have done, that might have made that a positive experience for them?	Is there anything that you might do differently? If yes: can you please describe in what circumstances you might do this? And why?
Are you able to give me any examples of how the pandemic has changed how you engage with older people specifically?	What has worked well for you? and what hasn't worked so well
<b>Thinking ahead</b>	
Can you think of any ways in which you might be able to undertake more effective assessments with older people?	What are they hoping to achieve? What is stopping them?
One way that assessments might be undertaken differently, is by them being undertaken remotely or by using different types of technology, and I am going to ask you your thoughts on some examples: <ul style="list-style-type: none"> <li>• What do you think conducting assessments with older people remotely; for example by telephone or video?</li> <li>• What do you think about using different ways that older people might share their information with you; for example filling out questionnaires?</li> <li>• What do you think about using equipment that collects older people's information, for example taking their own blood pressure and sending to you, you will have access to the results?</li> <li>• What do you think about older people using a mobile phone to share information about how they are doing with you; for example, a weekly phone check-in with healthcare staff?</li> <li>• What do you think about older people using wearable technology, for example a pedometer or fitbit that collects data about their movement or exercise?</li> </ul>	Prompt as to what informs their thinking, any preferences, and concerns or challenges eg any people/groups that not appropriate for/make things worse? How do you avoid inequalities in access to care  When might these be helpful or beneficial to older people? What might they need to engage effectively
If we were to evaluate a new intervention for older people or, what do you think that we should measure to see if it works?	How could we measure the impact of a new intervention?

Is there something else that I have not asked you about, that you would like to tell me about?

**Thank you**

## COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Section/Page No.
<b>Domain 1: Research team and reflexivity</b>			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Methods/Design
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	PhD
Occupation	3	What was their occupation at the time of the study?	Methods/Design
Gender	4	Was the researcher male or female?	Methods/Design
Experience and training	5	What experience or training did the researcher have?	Methods/Design
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	Methods/Sampling and recruitment
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Appendix1 and 2
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Declaration
<b>Domain 2: Study design</b>			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods/ Data collection and Data analysis
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods/Sampling and recruitment
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods/Sampling and recruitment
Sample size	12	How many participants were in the study?	Results/older people and Healthcare professionals
Non-participation	13	How many people refused to participate or dropped out? Reasons?	Results/older people and Healthcare professionals
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Methods/Sampling and recruitment
Presence of nonparticipants	15	Was anyone else present besides the participants and researchers?	Results/older people

Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Results/older people and Healthcare professionals
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods/ Data collection
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Methods/ Data collection
Field notes	20	Were field notes made during and/or after the inter view or focus group?	Methods/ Data collection
Duration	21	What was the duration of the inter views or focus group?	Results/older people and Healthcare professionals
Data saturation	22	Was data saturation discussed?	NA
Transcripts returned	23	Were transcripts returned to participants for comment and/or	NA
<b>Topic</b>	<b>Item No.</b>	<b>Guide Questions/Description</b>	<b>Reported on Page No.</b>
		correction?	NA
<b>Domain 3: analysis and findings</b>			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	Methods/ Data analysis
Description of the coding tree	25	Did authors provide a description of the coding tree?	Methods/ Data analysis
Derivation of themes	26	Were themes identified in advance or derived from the data?	Methods/ Data analysis
Software	27	What software, if applicable, was used to manage the data?	Methods/ Data analysis
Participant checking	28	Did participants provide feedback on the findings?	NA
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results
Data and findings consistent	30	Was there consistency between the data presented and the findings?	Results and Discussion
Clarity of major themes	31	Were major themes clearly presented in the findings?	Results
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Results

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.**

# BMJ Open

## How can we improve Comprehensive Geriatric Assessment for older people living with frailty in primary care and community settings? A Qualitative Study

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Keywords:	QUALITATIVE RESEARCH, GERIATRIC MEDICINE, Aging, Frailty

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4 1 **How can we improve Comprehensive Geriatric Assessment for older people living**  
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6 2 **with frailty in primary care and community settings? A Qualitative Study**  
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9  
10 3 Aseel Mahmoud<sup>1</sup>, \*Victoria A Goodwin<sup>1</sup>, Naomi Morley<sup>1</sup>, Julie Whitney<sup>2</sup>, Sarah E Lamb<sup>1</sup>, Helen  
11  
12 4 Lyndon<sup>3,4</sup>, Siobhan Creanor<sup>1</sup>, Julia Frost<sup>1</sup> on behalf of the DREAM Study Team  
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30

31  
32 11 **Abstract**  
33

34  
35 12 **Objective**  
36

37  
38 13 With advancing age comes the increasing prevalence of frailty and increased risk of adverse  
39  
40 14 outcomes (e.g. hospitalisation). Evidence for Comprehensive Geriatric Assessment (CGA), a multi-  
41  
42 15 dimensional holistic model of care, is mixed in community settings. Uncertainties remain, such as the  
43  
44 16 key components of CGA, who delivers it, and the use of technology. This study aimed to understand  
45  
46 17 perspectives, beliefs and experiences, of both older people and health professionals, to improve the  
47  
48 18 current CGA, and explore factors that may impact on CGA delivery in community settings.  
49

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51 19 **Design**  
52

53  
54 20 A qualitative interview study was conducted with older people and health care professionals  
55  
56 21 identified using a maximum variation strategy. Data were analysed using an abductive analysis  
57  
58 22 approach. The Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) framework  
59  
60

23 and the Theoretical Framework of Acceptability guided the categorisation of the codes, and  
24 identified categories were mapped to the two frameworks.

## 25 **Setting**

26 England, United Kingdom

## 27 **Results**

28 Twenty-seven people were interviewed, constituting 14 older people and 13 healthcare  
29 professionals (HCPs). We identified limitations in the current CGA: a lack of information sharing  
30 between different healthcare professionals who deliver CGA; poor communication between older  
31 people and their HCPs; and a lack of follow-up as part of CGA. When we discussed the potential for  
32 CGA to utilise technology, HCPs and older people varied in their readiness to engage with it.

## 33 **Conclusions**

34 Viable solutions to address gaps in the current delivery of CGA include the provision of training and  
35 support to use digital technology and a designated comprehensive care coordinator. The next stage  
36 of this research will use these findings, existing evidence and stakeholder engagement, to develop  
37 and refine a model of community based CGA that can be assessed for feasibility and acceptability.

## 38 **Keywords**

39 Ageing, comprehensive geriatric assessment, digital technology, frailty, qualitative.

## 40 **Strengths and Limitations**

- 41 • Use of qualitative interviews enabled rich data on exploration and synthesis of older people  
42 and healthcare professionals.
- 43 • Our theoretically informed qualitative research and stakeholder insights identified both  
44 challenges to the current delivery of CGA as well as opportunities for the improvement of  
45 CGA for older people with frailty.

- 1  
2  
3 46       • Our study is deliberately exploratory; thus the findings may not be transferable to other  
4  
5 47           older people and healthcare professionals. However, we recruited older people with frailty  
6  
7 48           and HCPs with a wide variety of views and experiences.  
8  
9

## 10 49 **Introduction**

11  
12  
13  
14 50   Between 2020 and 2050 the number of people worldwide aged over 80 will triple to reach 26 million  
15  
16 51   (1). With ageing, people are more susceptible to develop multiple, long-term conditions that reduce  
17  
18 52   their independence and quality of life (1-4). This is due to underlying factors, such as falls, frailty, and  
19  
20 53   delirium (1, 3).

21  
22  
23  
24 54   Frailty is a clinical syndrome where multiple body systems deteriorate leading to increased  
25  
26 55   vulnerability (3, 5). Frailty increases the risk of falls, disability, hospitalisation, mortality, and contact  
27  
28 56   with healthcare services (5, 6). Prevention and reversal of frailty can enable people to stay well and  
29  
30 57   live independently for longer (3). Frailty affects half of the UK population aged over 85 and costs the  
31  
32 58   publicly funded National Health Service (NHS) £5.8 billion per year (6). A key priority of the NHS in  
33  
34 59   the UK is to support older people with frailty to manage their long-term conditions (3, 7).

35  
36  
37  
38 60   Older people living with frailty need robust interventions tailored to the complexity of their care  
39  
40 61   needs (3, 8). Comprehensive Geriatric Assessment (CGA) is a multi-dimensional diagnostic and  
41  
42 62   therapeutic intervention that includes an assessment of physical, cognitive and psychosocial  
43  
44 63   components with the development of a holistic management plan in partnership with the older  
45  
46 64   person with frailty (8). CGA delivered in acute, primary and community settings aims to prevent  
47  
48 65   deterioration and complications associated with frailty (3, 9). However, the effectiveness of CGA for  
49  
50 66   older people with frailty in primary care and community settings is mixed (8, 10, 11). Ho et al  
51  
52 67   reported benefits in terms of the likelihood of living at home, reduced mortality, improved cognition,  
53  
54 68   and activities of daily living, but with uncertain benefits on quality of life (11), whereas Briggs and  
55  
56 69   colleagues found no difference in mortality, activities of daily living, quality of life and care home  
57  
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1  
2  
3 70 admissions (8). Descriptions of CGA components often lack detail, including the delineation of staff  
4  
5 71 involved in delivery, and an understanding about factors that affect implementation are limited (12).  
6  
7  
8 72 Recent NHS initiatives to strengthen the efficiency of outpatient services using alternative  
9  
10 73 approaches require consideration. For example, there is growing interest in the use of wearable  
11  
12 74 devices to monitor patients (7). The NHS Long Term Plan, and Digital Transformation Plan,  
13  
14 75 recommend the use of digital equipment in the assessment and monitoring of older people with  
15  
16 76 frailty; with the option of using wearable devices to ensure services are inclusive and available to all  
17  
18 77 (7, 12). However, digital technologies are not part of the existing evidence for CGA.  
19  
20  
21  
22 78 Regardless of the complexity and diversity of the needs of older people with frailty, some face  
23  
24 79 inequities in access to interventions which may help to maintain or improve their independence (3).  
25  
26 80 For example, whilst telemedicine can be beneficial, cost-effective and acceptable to older people (13),  
27  
28 81 there are concerns about digital exclusion (14) and risks that important signs and symptoms could be  
29  
30 82 missed (15). Improving the effectiveness and efficiency of CGA (11) requires exploration of how  
31  
32 83 individual components may work and how the overall intervention can be enhanced. The Digital and  
33  
34 84 Remote Enhancement for the Assessment and Management of Older People with Frailty (DREAM)  
35  
36 85 project aimed to develop a community-based model of CGA that incorporated technology. This  
37  
38 86 qualitative study aimed to understand perspectives, beliefs and experiences of both actual and  
39  
40 87 potential providers and users to improve the current CGA and explore the factors that may impact  
41  
42 88 on CGA delivery in community settings, including the use of technology.  
43  
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47

## 48 **Methods**

### 51 **Design**

52  
53 91 A qualitative interview study with older people and health care professionals was conducted. AM, a  
54  
55 92 female post-doctoral research fellow and pharmacist, collected and analysed the data in  
56  
57 93 collaboration with VG (a female academic physiotherapist) and JF (a female medical sociologist). All  
58  
59  
60

1  
2  
3 94 had experience of conducting qualitative research. Ethical approval was issued by the University of  
4  
5 95 Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407). The study has been  
6  
7 96 reported according to the Consolidated Criteria for Reporting Qualitative Study (COREQ) guidelines  
8  
9  
10 97 (16).

### 98 **Patient and Public Engagement**

99 Patient Public Involvement and Engagement (PPIE) and Health and Care Professional (HCP) advisory  
100 groups contributed to the development, design and conduct of this research through a series of  
101 workshops. They contributed to developing and piloting topic guides for the interviews and provided  
102 analytical insight into preliminary findings through discussions.

### 103 **Sampling and Recruitment**

#### 104 *Older people*

105 Participants were recruited from the Community Ageing Research (CARE) 75+ (17) or the Oxford Pain  
106 Activity and Lifestyle (OPAL) (18) cohorts. Both CARE75+ and OPAL are representative, prospective  
107 longitudinal studies designed as both epidemiological studies of older people living in the  
108 community in the UK and as recruitment platforms to help overcome some of the challenges of  
109 older people being under-represented in research (19). We applied a maximum variation sampling  
110 strategy to identify Care75+ and OPAL participants who had consented to be contacted, to capture  
111 diversity in gender, ethnicity, living circumstances, socioeconomic factors, geography, frailty, sensory  
112 (e.g. visual or hearing problems), and memory problems. Batches of invitations to participate were  
113 sent out to 15-20 people at a time by AM (for Care75+ participants) and the OPAL research team (for  
114 OPAL participants). In total, 132 invitations were sent out. We continued recruiting from May 2022  
115 to December 202 until our concurrent analysis yielded an in-depth understanding of where and how  
116 CGA might be improved.

#### 117 *Healthcare Professionals*

1  
2  
3 118 For healthcare professionals, we also used a maximum variation sampling strategy (21), to ensure  
4  
5 119 representation of professional background, geographical location, and gender. We invited health  
6  
7 120 and social care professionals working in non-hospital settings in the UK working with older people  
8  
9 121 living with frailty via social media (Twitter and Facebook) and via professional networks.  
10  
11  
12

13 122 All older people and healthcare professionals who expressed an interest in taking part were  
14  
15 123 recruited.  
16  
17

### 18 124 **Data collection**

19  
20 125 We developed semi-structured topic guides (21, 22) for older people (Additional file 1) and HCPs  
21  
22 126 (Additional file 2) based on a review of literature and online workshop discussions with our two  
23  
24 127 advisory groups made up of older people, family members, and HCPs. We did not use the term CGA  
25  
26 128 in the interviews with older people as advised by the two advisory groups. Topic domains were  
27  
28 129 aligned to the Non-adoption, Abandonment, Scale up, Spread and Sustainability (NASSS) framework  
29  
30 130 to ensure collection of rich data and to explicitly focus our analysis on how best to improve CGA (23).  
31  
32 131 The NASSS framework has previously been used to explain the interacting factors that affect the  
33  
34 132 implementation of complex interventions that utilise technology and generate mixed outcomes (23,  
35  
36 133 24). AM piloted the topic guide with members of the PPIE advisory group and refined one question  
37  
38 134 (concerning outcomes to be measured) for clarity. The topic guide enabled consistency in the data  
39  
40 135 collection, with the interviews flexible enough to allow the participants to explain what was  
41  
42 136 important to them (25). The interviews were conducted face-to-face, via telephone or video call,  
43  
44 137 depending on the participants' preference (21). AM introduced herself and explained the aim of the  
45  
46 138 study to the interviewee at the beginning of each interview. The audio-recorded interviews were  
47  
48 139 transcribed by a GDPR compliant transcriber and checked for accuracy by AM. Fieldnotes captured  
49  
50 140 the context of the interview. AM had no previous contact with any of the participants.  
51  
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## 141 **Data analysis**

142 We undertook abductive analysis (26), and used NVivo 13 (Release 1.7) (27) to manage the data. This  
143 involved an iterative approach to analysis, to facilitate understanding (25, 28). We coded the  
144 interviews in cycles, with deductive codes from the literature and inductive codes generated by AM,  
145 identifying similar ideas or concepts that could be categorised into a code (25, 29). This enabled  
146 balance between data relating to pre-existing concepts and data based on the perspectives of the  
147 participants (26, 30). We (AM, VG and JF) then developed a conceptual map of the different  
148 participants' perspectives (22). The NASSS framework, and the Theoretical Framework of  
149 Acceptability (23, 31) guided the categorisation of the codes. The categories were then mapped to  
150 the two frameworks, which enabled further elaboration of the complexity within the domains of an  
151 intended CGA intervention that utilises technology. For example, the broad analytical category  
152 'Organisation' was constituted by various coding categories, including person-centred and accessible  
153 records, digital enabling for staff, information sharing between HCPs and continuity of care. We used  
154 a conceptual map to create a hypothetical case (vignette) of an older person who participated in a  
155 CGA that used technology (32). We used the vignette in the final three interviews with HCPs, to  
156 extend our understanding of the potential afforded by technology. Preliminary findings were  
157 presented to the advisory groups for discussion and consideration of their interpretations.

## 158 **Results**

### 159 **Older people**

160 Fourteen older people consented to participate and were interviewed. Respondents were aged  
161 between 75 and 90 years old, were evenly split between males and females, and included  
162 participants with hearing and/or visual impairment, mobility impairments, and with one or more  
163 long term condition. One participant asked to be interviewed in the presence of their carer (a  
164 spouse). The interviews lasted between 16 and 92 minutes. (Table 1).

165 *Table 1 Demographic characteristics of older people with frailty*

Participant Pseudonym	Gender	Age	Current residence in England	Living circumstances	Mode of interview
Robert	Male	84	North East	Live alone	Telephone interview
James	Male	83	South West	Live alone	In-person interview
Richard	Male	82	South West	Live with spouse	Online audio call
William	Male	90	North East	Live with spouse	Online video call
Barbara	Female	82	North East	Live with spouse	Telephone interview
Gary	Male	76	North East	Live with spouse	Telephone interview
Karen	Female	79	South East	Live alone	Online video call
Steven	Male	75	South East	Live with spouse	Telephone interview
Shirley	Female	79	Midlands	Live alone	Telephone interview
Frances	Female	89	South East	Live alone	Telephone interview
Carol	Female	82	North West	Live alone	Telephone interview
Donna	Female	85	South East	Live alone	Telephone interview
Frank	Male	80	Midlands	Live with spouse	Telephone interview
Lois	Female	86	South West	Live with spouse	Telephone interview

166

### 167 Healthcare professionals

168 The thirteen HCPs came from different professional backgrounds, and from different geographical  
 169 areas of England. All of the participants were working, or had worked, with older people with frailty,  
 170 for a duration of two to 30 years (Table 2). The interview duration ranged between 33 and 160  
 171 minutes.

172 *Table 2 Demographic characteristics for HCPs who participated in the study*

Participant number	Profession	Years of providing care to older people	Location in England	Gender	Mode of interview
HP1	Frailty assistant practitioner	20	South West	Female	Online
HP2	Nurse	15	South West	Male	Online
HP3	GP	Retired	North East	Female	Online
HP4	Physiotherapist	19	South West	Female	Online



HP5	GP	16	South West	Female	Online
HP6	Physiotherapist	30	South West	Female	Online
HP7	Nurse	15	South West	Female	Online
HP8	Nurse	2	South East	Female	Online
HP9	Occupational therapist	10	South East	Female	Online
HP10	Consultant Geriatrician	23	North West	Male	Online
HP11	Consultant Geriatrician	19	Midlands	Female	Online
HP12	Physiotherapist	4	Midlands	Female	Online
HP13	Pharmacist	3	North West	Female	Online

173

174 We identified patterns about the conditions to enhance CGA across the two data sets, then classified  
 175 these patterns into the eight domains of the NASSS framework and to the Framework of  
 176 Acceptability (23, 31). Here we present the four domains that were most important for both the  
 177 patient and professional participants: frailty (the condition), intended adopters (both professional  
 178 and lay), organisational factors (such as workforce challenges), and acceptability (of technology and  
 179 assessment).

### 180 **Frailty**

181 Amongst HCPs, there was an appreciation of the complexity of frailty. Regardless of whether they  
 182 have a need for acute care or not, all older people with frailty have complex needs due to having  
 183 multiple long-term conditions, impairments and/or socioeconomic factors:

---

184 *“Most of them are aged 80 almost all of them are frail and so they have multiple chronic*  
 185 *conditions, they have got polypharmacy they tend to need some help with one or more*  
 186 *activities of daily living”.* (HP13, Pharmacist)

---

187 HCPs from different professions tend to provide a comprehensive assessment that involves physical,  
 188 psychological and social needs for older people with acute and non-acute care needs. However,  
 189 there is a need to provide older frail people with assessment prior to a crisis developing:

---

190 *“All the domains yeah, the psychological, physical all those you know functional,*  
 191 *environmental you know do you live in a house, a flat, bungalow, do you sleep upstairs, any*  
 192 *falls you know any equipment in the toilet, that kind of thing and social you know do you*  
 193 *get out.” (HP12, Physiotherapist)*

194 *“So, if you’re trying to keep somebody weller for longer, then any of those proactive*  
 195 *interventions rather than waiting until they get to crisis point.” (HP9, Occupational*  
 196 *therapist)*

---

197 We interviewed older people with frailty who were socioeconomically disadvantaged and/or  
 198 experienced sensory or physical impairment that can exacerbate the complexity of their care needs.  
 199 For example, Carol had financial challenges, restricted mobility, visual impairment, multiple long-  
 200 term conditions, and a high risk of falling. Carol had limited choices in access to care, because of her  
 201 restricted ability to travel to appointments, lack of a support network, and no access to technology:

---

202 *“I’ve been a single person all my life and I get the basic state pension. So, I’ve never ever*  
 203 *been able to afford the technology that people use every day to day in these days and*  
 204 *that’s the reason I don’t have it.” (Carol, 82 years old)*

---

205 On the other hand, Karen lived alone, but has regular communication with family and friends. During  
 206 her health and care journey, Karen was able to enact her own health decisions and avoided long NHS  
 207 waiting time for tests and referrals:

---

208 *“I only saw the consultant yesterday, so the next steps haven’t been put in place yet.*  
 209 *Unfortunately, I have had to pay privately for it and the NHS seems to be in such a mess*  
 210 *and the doctor did want to send me off for tests but she couldn’t justify so, more or less*  
 211 *saying well you know it is as it is we can’t do anything more for you because we haven’t got*  
 212 *proof that this test or that test is something we can do, something we can justify. [...] I’ll*  
 213 *have to pay for that privately otherwise I will just be waiting too long. You know I am*  
 214 *getting on I don’t want the last two or three years probably of my life to be sitting around*  
 215 *at home feeling sorry for myself.” (Karen, 79 years old)*

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## 216 **Intended adopters**

217 Some HCPs indicated that an HCPs occupational background may inform the scope of assessment  
 218 during the CGA, and the quality of the CGA that they offer. A nurse who led a frailty team showed

1  
2  
3 219 appreciation of the range of HCP backgrounds in their team, which enabled them to involve the  
4  
5 220 most suitable HCP (e.g. in terms of their skill set), to meet the unique needs of the older person:  
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10 221 *“obviously if it was things like their ability to perform their physical activity to daily living*  
11 222 *that maybe something that I would involve one of, I’ve got a colleague who is Band 4*  
12 223 *assistant practitioner whose got a therapy background she’s very good at looking at the*  
13 224 *nuts and bolts of how people physically manage [...] I will also do joint visits with OTs and*  
14 225 *physios if we’re feeling that we need to, that there’s a, that the referral makes it sound like*  
15 226 *this is very much that mixed picture of it’s not just a medical requirement or a strict nursing*  
16 227 *requirement that there’s an overlap with where my therapy colleagues would come in”.*  
17 228 *(HP2, Nurse)*  
18  
19

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20  
21 229 This contrasted consultant geriatrician (HP11) who also led a frailty team. HP11 indicated that  
22  
23 230 regardless of the different backgrounds of HCPs in their team, there should be no differences in the  
24  
25 231 CGA that they provide to older people with frailty. However, HP11 highlighted that some professions  
26  
27 232 may have limited ability to understand the complexity of older people’s care needs. This was  
28  
29 233 congruent with the views from older people who thought that their care needs could be managed  
30  
31 234 better by an HCP with knowledge and experience of older people with frailty:  
32  
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36  
37 235 *“They all do the same because they’ve all had their advanced [...], course the advanced*  
38 236 *assessment healthcare assessment course. They’ve all done the same course ok,”. (HP11,*  
39 237 *Consultant Geriatrician)*  
40  
41

42 238 *“You could have one doctor who is in the practice who specialised in old people you know*  
43 239 *just for the aged to sort of he specialised in the aged. [...] where old people could feel they*  
44 240 *could go [...] rather than a general practitioner maybe somebody that was for the old and*  
45 241 *the frail.” (Barbara, 82 years old)*  
46  
47

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48  
49 242 A GP (HP3) thought that the ability to deliver CGA depends upon the investigative and  
50  
51 243 communication skills, and previous experience of staff, and it is not restricted to a particular  
52  
53 244 background:  
54  
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57  
58 245 *“So, I tend to work on a concept that I don’t like thinking about professions doing things I*  
59 246 *like to think about competencies.” (HP3, GP)*  
60

1  
2  
3 247 Some HCPs suggested that HCPs may require training to improve interpersonal skills, in terms of  
4  
5 248 communication and attention to detail, to ensure enhancement of CGA. For example, HP12 (a  
6  
7 249 Physiotherapist) shared their personal experience of developing their investigational skills when  
8  
9 250 providing remote CGA over time. HP7 (a Nurse) shared their experience of supporting new HCPs in  
10  
11 251 their team to learn how to pick-up non-verbal cues during home visits, to support identifying care  
12  
13 252 needs and provide CGA.  
14  
15

### 17 253 **Organisation**

18  
19 254 Interviewing HCPs from different geographical areas of England allowed us to explore organisational  
20  
21 255 limitations, which would require innovation to increase readiness for new forms of technology-  
22  
23 256 informed care delivery.  
24  
25

26  
27 257 Some HCPs made references to fear and resistance to trying new ways of care delivery. For example,  
28  
29 258 a nurse (HP2) referred to themselves as ‘a dinosaur’ when it comes to trying new technologies.  
30  
31 259 Similarly, a frailty assistant practitioner (HP1) also indicated that practitioners may need support  
32  
33 260 from colleagues, while a consultant geriatrician (HP11) shared the challenges they had when using  
34  
35 261 technology and the time needed for training to use new technology:  
36  
37  
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40 262 *“There’s also the training aspect of it. Training takes a long time you go in and sit down and*  
41 263 *have training whatever new technology comes you have to find time to go for training and*  
42 264 *you actually don’t get to understand its use until you start using it and the problems that*  
43 265 *you get when you start using it”. (HP11, Consultant Geriatrician)*  
44  
45

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46  
47 266 Almost all HCPs discussed the negative impact of using different clinical databases in various settings  
48  
49 267 on their ability to share and/or access patients’ records. HCPs discussed the importance of having a  
50  
51 268 well-established information sharing process between HCPs in different settings in enhancement of  
52  
53 269 CGA. HCPs shared their experiences of meeting the challenges in information sharing. For example,  
54  
55 270 sharing data in regular Multi-Disciplinary Team (MDT) meetings, provides access to the GP medical  
56  
57 271 records for HCPs who work in the community, which enables them to effectively support the older  
58  
59  
60

1  
2  
3 272 people with whom they work. Some organisations have a sharing document that all HCPs involved in  
4  
5 273 CGA can use to input and share data, which staff found beneficial in terms of the availability of  
6  
7  
8 274 information and efficiency in obtaining key information when needed:  
9  
10

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11  
12 275 *“I’ve not seen they’ve had a CGA, their clinical frailty scale is this, blah, blah, blah never*  
13 276 *seen it never ever. Never ever, ever seen it. So, information is not coming it is not flowing”.*  
14 277 *(HP12, Physiotherapist)*  
15

16  
17 278 *“I just from previous experience I knew these sorts of things I needed to have so I made*  
18 279 *sure that I discussed it with the CCG and got them to put this in place because I didn’t want*  
19 280 *to be spending exactly like the nurse, two hours, trying to get information when in five*  
20 281 *minutes I can have that information.” (HP10, Consultant Geriatrician)*  
21  
22

23 282 *“So, for me to be able to know what medicines somebody is on, I have to have access to*  
24 283 *that or I’ve got ask somebody who has access to check for me ok”. (HP11, Consultant*  
25 284 *Geriatrician)*  
26  
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28  
29 285 Lack of staff capacity was perceived as a limitation for delivering CGA by all HCPs, which may inhibit  
30  
31 286 delivery of timely support which an older people may require. Some older people recognised the  
32  
33 287 limited staff availability and the increasing demands on the GP practices that inhibit continuity in  
34  
35 288 care. For them, lack of continuity decreases their engagement with their care:  
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39  
40 289 *“More of us, more availability [...] I mean we are running its sort of like a virtual ward model*  
41 290 *but it’s going to be, we have less staff on at a weekend. So, our capacity to take new*  
42 291 *referrals on a Friday and over the weekend is a lot less.” (HP9, Occupational therapist)*  
43  
44

45 292 *““When you see the doctor, you know you barely it’s a locum that I see I don’t see my own*  
46 293 *doctor.”.” (Shirley, 79 years old)*  
47  
48

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49  
50 294 Other older people with frailty understood the current workforce challenges in the NHS and  
51  
52 295 suggested that improved communication between HCPs and sharing information may mitigate the  
53  
54 296 current lack of continuity:  
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297 *“GPs talk to each other and that you know if you go in and you see somebody who is not*  
298 *your designated GP you know that fine well that the notes are there [...]. So, you feel*  
299 *perfectly happy that you know whoever you are seeing, knows what they are talking*  
300 *about.” (Lois, 86 years old)*

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301 However, we identified that when an older person can identify a key contact person to support  
302 them, this can mitigate a lack of continuity in their care, because they key person can co-ordinate  
303 their care and ensure the continuous flow of communication:

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304 *“So, I sort of stayed involved in this case as a coordinating factor because you know it*  
305 *happens when too many people are involved things the outcome might not be good or the*  
306 *people can get lost in translation and so I managed to speak to the mental health team and*  
307 *everything and draw all the people that the GP had referred to, to a point where I said now,*  
308 *you need to take this forward.” (HP12, Physiotherapist)*

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### 309 **Acceptability**

310 We identified elements that might influence acceptability by older people with frailty, that should be  
311 taken into consideration when enhancing CGA.

312 Although HCPs perceived that older people were satisfied with CGA and the care provided to them,  
313 some older people indicated that they could not freely communicate with HCPs and express their  
314 needs, because of perceived short appointments with their GP. Furthermore, older people lacked  
315 trust in their HCPs, or the clinical decisions made about their treatment plan:

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316 *“I would say the consistent feedback is normally that they’re greatly relieved that we’ve*  
317 *given the time ‘cos we don’t time specify our visits” (HP2, Nurse)*

318 *“No, it’s so quick and it’s so, I mean in person, well I wouldn’t say personal you know when*  
319 *you speak to a doctor like I did with my old doctor if he, it was just a different attitude*  
320 *towards you, it’s like a conveyor belt, you come in, you go out, you come in and you go out*  
321 *so, you know you just feel it’s not the same what it was before.” (Shirley, 79 years old)*

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322 Moreover, HCPs acknowledged the variation in older people readiness to engage with new ways of  
323 care delivery:

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324 *“There is a high risk of inequalities because anytime you are going introduce something*  
325 *different new, there are going to be people who can use it very easily and there are going*  
326 *to be those who can’t for whatever reasons”. (HP13, Pharmacist)*

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327 This aligned with the findings from interviews with the older people themselves. For example, Karen  
328 showed readiness to engage with new ways of receiving technology-informed care because she had  
329 previous experience of using technology in her healthcare, and in communication with family  
330 members. In contrast, Shirley rejected engagement with new forms of remote appointments:

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331 *“They did ask me once yes, but I said, well, I don’t know how to do it, let’s put it that way a*  
332 *video appointment I mean I don’t [...] I have a mobile phone so, you know I just don’t know*  
333 *how to do it. So, the other solution was that they speak to me over the phone”. (Shirley, 79*  
334 *years old)*

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335 Lack of physical access to technology (e.g. a device or internet connection) can inhibit an older  
336 person's opportunity to learn how to use technology, which may subsequently limit their readiness  
337 to engage with new forms of technology informed care. Therefore, those with frailty may require  
338 additional support to engage with CGA that utilises technology. For example, older people with  
339 sensory impairment may require specialist adaptation to their device, or support from a carer to  
340 engage; whereas older people who are already digitally literate may only need educational input on  
341 how to use a new technology.

342 HCPs recognised the variation in the needs and preferences of older people with frailty and  
343 discussed how they tailor CGA to the person’s needs:

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344 *“I would say we’re able to be very person-centred we’re not looking at things from a*  
345 *clinician’s perspective only we will explore things from the patient’s perspective in terms of*  
346 *what they think is their problems.” (HP4, Physiotherapist)*

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347 Some HCPs thought that the presence of a carer, a family member or support network may increase  
348 a frail older person's acceptance of CGA that utilises technology. However, HCPs acknowledged the

1  
2  
3 349 higher demands on the carer which may reduce the support they can provide, to help the older adult  
4  
5 350 engage with technology. A GP (HP3) shared examples of caregivers who inadvertently disempower  
6  
7 351 the older person, in terms of decision-making about their healthcare choices. Older people may  
8  
9  
10 352 therefore require support from a wider network, and not only their carer:  
11  
12

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13  
14 353 *“Some of them have families who help them but they still like you know eye contact,*  
15 354 *physical contact and the written word, you know paper, hard copy of anything. So, I am*  
16 355 *afraid that’s something that they’ll eventually all pop off but and thankfully the younger*  
17 356 *ones are you know quite capable of using all these devices.” (Barbara, 82 years old)*  
18  
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20  
21 357 HCPs may not be able to provide the required follow-up after an assessment, important for tracking  
22  
23 358 the referrals to other services if needed and the management plan provided to the patient. Similarly,  
24  
25 359 older people explained the challenges that they were facing in following-up the HCPs; for example,  
26  
27 360 to find out the result of a test, or to book an appointment:  
28  
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31  
32  
33 361 *“I would like to think we’re good at going out and identifying the problem we’re good at*  
34 362 *negotiating a management plan with someone it’s then how do you monitor the effect of*  
35 363 *that management plan”. (HP2, Nurse)*  
36

37 364 *“I had to phone my practice after I’d been to see the 111 doctor and she said get in touch*  
38 365 *with your practice and I got this sort of non-committal reply oh, well you’d better start your*  
39 366 *antibiotics and I was quite disappointed that they didn’t get in touch with me because*  
40 367 *they’d given me that advice without having seen a report and I thought well I would have*  
41 368 *expected something to come back but like I said, I was really not well enough to do*  
42 369 *anything about it”. (Donna, 85 years old)*  
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## 45 46 370 **Discussion**

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49  
50 371 This study explored the factors that may impact on CGA delivery in community settings, including  
51  
52 372 the use of technology. This research adds to the current growing evidence on challenges on  
53  
54 373 delivering effective CGA in community settings and identified factors to enhance CGA in community  
55  
56 374 settings from the perspectives of older people and HCPs.  
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3 375 In this study, we identified key challenges to the enhancement of CGA in the community, including:  
4  
5 376 information sharing between different HCPs who are delivering the CGA; communication between  
6  
7 377 older people and their HCPs; and follow-up appointments after conducting the CGA. From the  
8  
9 378 current challenges that were explained by participants, and suggestions which they made to address  
10  
11 379 them, workshop discussions with advisory group members and existing literature, we identified  
12  
13 380 factors to enhance CGA in the community.  
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16

17 381 Both HCPs and older people considered that the delivery of CGA should not be limited to those from  
18  
19 382 specific professions but should be based upon HCPs competency and knowledge of the complexity of  
20  
21 383 need for older people with frailty. This finding aligns with the Ageing Well Network of Enhanced Care  
22  
23 384 for older People (EnCOP) competency framework (33); an aim of which is to enhance staff  
24  
25 385 competency in working anywhere in the care system (33). The Health Education England and NHS  
26  
27 386 England commissioned the Frailty Core Capabilities Framework in 2018 to identify skills and  
28  
29 387 behaviours required to deliver high quality of care to older people with frailty (34). However, there is  
30  
31 388 limited use of the framework in commissioning education or training, reflected in the results of  
32  
33 389 evaluation surveys that were conducted in 2018 and 2019 (35). We suggest that upskilling staff and  
34  
35 390 providing them with appropriate training to improve their communication and investigation skills  
36  
37 391 may be a viable solution to mitigate the negative impact of workforce shortages on the effectiveness  
38  
39 392 of CGA.  
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45 393 From conducting interviews augmented by workshop discussions with advisory group members, we  
46  
47 394 identified the need for assigning a member of staff or MDT team to a co-ordinating role, which we  
48  
49 395 designated as "Comprehensive Care Coordinator". This person could coordinate the delivery of CGA  
50  
51 396 by facilitating information sharing between different HCPs, communicating with older people with  
52  
53 397 frailty on a regular basis, and ensuring that the management plan including referrals is acted upon.  
54  
55 398 Designating a care coordinator may improve continuity of care with one point of contact and provide  
56  
57 399 reassurance through a therapeutic, long-term relationship. This may provide reassurance to the  
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1  
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3 400 older person and ensure effective follow-up of any management plan. Care coordinator roles in the  
4  
5 401 community, including case managers, may reduce emergencies. However, evidence shows variation  
6  
7 402 in the role in different studies in terms of duration and frequency of home visits and HCPs who  
8  
9  
10 403 coordinated the care (11, 36, 37). Further research needs to identify who could best coordinate care  
11  
12 404 in older people and what the best approach may be.

13  
14  
15 405 Moreover, HCPs agreed that utilising technology in the delivery of CGA may enable HCPs to provide  
16  
17 406 support for older people without compromising their follow-up. The NHS plan highlighted the need  
18  
19 407 for enhancing the use of technology in healthcare, to change how care is being provided to patients;  
20  
21 408 and to create joined up computer systems that give staff sufficient access to data, to provide  
22  
23  
24 409 improved care for patients (7). However, there is a need for digital upskilling of staff to support their  
25  
26 410 effective use of technology in healthcare (38).

27  
28  
29 411 Different IT-systems and a lack of information governance arrangements across different settings  
30  
31 412 currently inhibits information sharing and creates tension between HCPs in different settings. HCPs  
32  
33 413 told us that the lack of connection between different systems must be addressed, if they are to  
34  
35 414 deliver an effective CGA. Similarly, older people mentioned how lack of access to information  
36  
37 415 magnified unequal access to effective CGA, and support and care for older people with frailty. In  
38  
39  
40 416 February 2023, NHS Digital became responsible for digital technology, data and health and care  
41  
42 417 delivery. This has the potential to address some of the challenges in information sharing (39).

43  
44  
45 418 Existing research has identified the need for convenient platforms and improved digital records for  
46  
47 419 integrated care services for older people (including CGA) that maintain privacy and security when  
48  
49 420 sharing patient data between MDTs (38, 40). Such integrated platforms may enhance  
50  
51 421 communication and coordination of care (38, 40). However, resolving existing operational  
52  
53 422 complexities is likely to require additional funding and the creation of interoperable IT-systems (7,  
54  
55 423 38, 39, 41).

1  
2  
3 424 We found that socioeconomic factors, including living circumstances, income, and social network  
4  
5 425 impacted older peoples' treatment choices; in terms of whether they visited a clinical specialist and  
6  
7 426 waiting times for NHS appointments. This implies that when developing the CGA that utilises  
8  
9 427 technology we need to consider how to mitigate socioeconomic factors that inhibit access and  
10  
11 428 capacity to obtain the benefits of using digital equipment in the assessment and follow-up. Existing  
12  
13 429 research suggests that digital interventions are less effective in populations with socioeconomic  
14  
15 430 disadvantage compared with those with higher socioeconomic status (42). Although the COVID 19  
16  
17 431 pandemic accelerated the shift to online resources and services, and changed patient perceptions  
18  
19 432 and willingness to use technology, it increased digital inequalities (43, 44). Amongst those aged 75  
20  
21 433 and over in the UK, 42% do not use the internet, reporting a lack of digital skills as the main  
22  
23 434 reason (45). However, the older population is changing, and the next generation of older people are  
24  
25 435 more familiar with using technology, with 77% of those aged over 55 using a smart phone (46), and  
26  
27 436 55% of those aged 50-64 using the internet most days (45). However, increasing physical access to  
28  
29 437 connected devices and the internet alone may not be enough to reduce inequalities in access to CGA  
30  
31 438 that utilises technology (42, 43, 47). Therefore, training and support would be needed to ensure  
32  
33 439 older people could be digitally enabled; however, this may not be appropriate for everyone, and  
34  
35 440 support would need to be individualised (45).

36  
37 441 Using technology for monitoring and supporting older people with frailty is an NHS priority, and over  
38  
39 442 time there may be more opportunities for older people with frailty to access and use technology (7).  
40  
41 443 Research now needs to assess if these changes positively affect older people with frailty, support  
42  
43 444 engagement with CGA that utilises technology, and whether they diminish inequalities in access to  
44  
45 445 technology informed care.

46  
47 446 Qualitative interviews enabled exploration and synthesis of older people and HCPs perspectives.  
48  
49 447 Although we recruited a range of older people and HCPs with a wide variety of views and  
50  
51 448 experiences, our findings may not be transferable to all older people and HCPs who have different  
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2  
3 449 experiences or perspectives (e.g. we were unable to recruit any social workers despite employing  
4  
5 450 several strategies) (22, 25). However, our theoretically informed qualitative research and  
6  
7 451 stakeholder insights identified both challenges to the current delivery of CGA as well as  
8  
9 452 opportunities for the improvement of CGA for older people with frailty.  
10  
11  
12

## 13 453 **Conclusions**

14  
15  
16 454 We identified four factors to enable implementation of CGA in community: enhancing staff  
17  
18 455 competency in working with older people with frailty, creating interoperable IT-systems, assigning a  
19  
20 456 care coordinator for older people with frailty, and mitigation of the impact of inequalities in access  
21  
22 457 to digital care. Introducing technology and a designated comprehensive care coordinator may be  
23  
24 458 vital to addressing gaps in the current provision of CGA. These solutions may also positively affect  
25  
26 459 the acceptability of CGA in older people with frailty. The next stage of this research will further  
27  
28 460 develop, refine and test a model of improved CGA in community setting.  
29  
30  
31

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33  
34  
35  
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37  
38 463 contributed at every stage of the research.  
39  
40  
41

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## 10 584 **Authors' Contributions**

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15 585 VG and JW conceived the ideas for the research with the help of JF and SL. AM collected the data.  
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17 586 AM, JF and VG analysed the data. AM led the writing with the help of JF and VG. NM, HL, SL and SC  
18  
19 587 critically revised the manuscript. All authors and collaborators have approved the final version of the  
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21 588 article.  
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31  
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34 593 of Health and Social Care.  
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## 37 594 **Conflict of interests**

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40  
41 595 None.  
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## 44 596 **Ethics approval and consent to participate**

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48 597 All the participants gave written informed consent and consent to participate. Ethical approval was  
49  
50 598 issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref  
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3 **600 Consent for publication**  
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6  
7 601 The participants gave their consent to participate in the study and to publish anonymised quotes  
8  
9 602 from the interview transcripts. The names of the participants have been anonymised.  
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12 **603 Availability of data and materials**  
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15 604 Supplementary data mentioned in the text are available in the additional files.  
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18 **605 Additional files**  
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22 606 Additional file 1 contains topic guide for interviews with older people.  
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25 607 Additional file 2 contains topic guide for interviews with HCPs.  
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## Topic guide –Older people and carers

1 **Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be**  
 2 **discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.**  
 3

Topic	Prompts
<b>Background (NASS Domain Frailty)</b>	
Could you tell me a bit about yourself and what is important to you in your life /lives?	Who they are? Where they live? What do they do? Support networks
Does your health or personal situation impact on what is important to you?	How? why?)
<b>Appointments with health and care staff (NASS Domains CGA, Organisation, Intended adopters and Embedding)</b>	
Please can you think back to a recent appointment with a health or social care professional (such as a Dr or nurse), and tell me about what happened in that appointment	Thinking about things like asking questions, checking your ability to do something, or taking any measurements? Did you get the chance to say anything such as what is important to you
What did you think about how that appointment was conducted?	Whether they would have liked anything to have been done differently, or not done at all? what you would have liked to have happened? And why?
If an appointment went well, what were the things that were done, that made that a positive experience for you?	Anything that could have been done differently?
Are you able to give me any examples of how the pandemic has changed how you engage with health and care staff?	What has worked well for you? What hasn't worked so well?
<b>Thinking ahead (NASS Domain Technology)</b>	
<p>We are exploring different ways health and care professionals might conduct appointments with older people or find out about a person's health. I am going to ask you your thoughts about different ways they could do this:</p> <ul style="list-style-type: none"> <li>• What do you think about appointments being done remotely; for example by telephone or video?</li> <li>• What do you think about using different ways of sharing information on their current health with staff; for example filling out questionnaires?</li> <li>• What do you think about using equipment that collects information about your health, for example taking your own blood pressure and sending results to your GP?</li> <li>• What do you think about using a mobile phone to share information about how you are doing; for example, a weekly phone check-in with health or care staff?</li> <li>• What do you think about using wearable technology, for example a pedometer or fitbit that collects data about your movement or exercise?</li> </ul>	What informs their thinking, any preferences, concerns or worries? Can you think of any other older people for whom these might not be appropriate, could they make things worse, What sort of problems may pose particular challenges? Could these be helpful or beneficial to older people? What might be needed to use effectively?
For those who might struggle with technologies, can you think of ways in which staff can best support them to ensure they can still access to the best possible care? <b>(NASS Domains-Embedding)</b>	Who might struggle?
If we want to set up a new way of doing appointments using technology, what should we measure to see if the new way works? <b>(NASS Domain-Value Proposition)</b>	

58 Is there something else that I have not asked you about, that you would like to tell me about your health and healthcare?  
 59  
 60

Thank you.  
 DREAM

## Topic guide –Staff

**Researcher to introduce self, ask why participant interesting in taking part and orientate them as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.**

Topic	Prompts
<b>Background (NASS Domain Frailty and CGA)</b>	
Please can you tell me a bit about your professional background and current role?	How long and it what capacity have you been working with older people? Describe the setting you work in.
Please can you tell me a bit about the older people that you work with and the kinds of things that you do with them in consultations	Asking them questions, checking their ability to do something, or taking any measurements?; do you do things differently if they are acutely unwell vs proactive/preventative care; how do you tailor assessments and care to meet individual needs/what is important to them
<b>Current assessments (NASS Domains CGA, Organisation, Intended adopters and Embedding)</b>	
What do you think older people/carers think about what you assess and how you conduct assessments (CGA)	Do you think that they might like anything to be done differently, or not done at all?
If a consultation goes particularly well, what is it that you have done, that might have made that a positive experience for them?	Is there anything that you might do differently? If yes: can you please describe in what circumstances you might do this? And why?
Are you able to give me any examples of how the pandemic has changed how you engage with older people specifically?	What has worked well for you? and what hasn't worked so well
<b>Thinking ahead (NASS Domain Technology)</b>	
Can you think of any ways in which you might be able to undertake more effective assessments with older people?	What are they hoping to achieve? What is stopping them?
One way that assessments might be undertaken different, is by them being undertaken remotely or by using different types of technology, and I am going to ask you your thoughts on some examples: <ul style="list-style-type: none"> <li>• What do you think conducting assessments with older people remotely; for example by telephone or video?</li> <li>• What do you think about using different ways that older people might share their information with you; for example filling out questionnaires?</li> <li>• What do you think about using equipment that collects older people's information, for example taking their own blood pressure and sending to you, you will have access to the results?</li> <li>• What do you think about older people using a mobile phone to share information about how they are doing with you; for example, a weekly phone check-in with healthcare staff?</li> <li>• What do you think about older people using wearable technology, for example a pedometer or fitbit that collects data about their movement or exercise?</li> </ul>	Prompt as to what informs their thinking, any preferences, and concerns or challenges eg any people/groups that not appropriate for/make things worse? How do you avoid inequalities in access to care  When might these be helpful or beneficial to older people? What might they need to engage effectively
If we were to evaluate a new intervention for older people or, what do you think that we should measure to see if it works? <b>(NASS Domain-Value Proposition)</b>	How could we measure the impact of a new intervention?

Is there something else that I have not asked you about, that you would like to tell me about?

**Thank you**

## COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Section/Page No.
<b>Domain 1: Research team and reflexivity</b>			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Methods/Design/ P4
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	Methods/Design/P4
Occupation	3	What was their occupation at the time of the study?	Methods/Design/P4-5
Gender	4	Was the researcher male or female?	Methods/Design/P4
Experience and training	5	What experience or training did the researcher have?	Methods/Design/ P4-5
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	Methods/Data collection / P6
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Methods/Data collection / P6 and additional files 1 and 2
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Methods/Design/ P4
<b>Domain 2: Study design</b>			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods/ Data collection and Data analysis/ P6, P7
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods/Sampling and recruitment/ P5
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods/Sampling and recruitment/ P5
Sample size	12	How many participants were in the study?	Results/older people and Healthcare professionals/ P7-9
Non-participation	13	How many people refused to participate or dropped out? Reasons?	Methods/Sampling and recruitment/ P5
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Methods/Data collection/ P6
Presence of nonparticipants	15	Was anyone else present besides the participants and researchers?	Results/older people/ P7

1	Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Results/older people and Healthcare professionals/ P7-9
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4	<i>Data collection</i>			
5	Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods/ Data collection/ P6
6				
7	Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
8				
9	Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Methods/ Data collection/ P6
10				
11	Field notes	20	Were field notes made during and/or after the inter view or focus group?	Methods/ Data collection/ P6
12				
13	Duration	21	What was the duration of the inter views or focus group?	Results/older people and Healthcare professionals/ P7-9
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15	Data saturation	22	Was data saturation discussed?	Methods/Sampling and recruitment/ P5
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17	Transcripts returned	23	Were transcripts returned to participants for comment and/or	NA
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19	<b>Topic</b>	<b>Item No.</b>	<b>Guide Questions/Description</b>	<b>Reported on Page No.</b>
20			correction?	NA
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25	<b>Domain 3: analysis and findings</b>			
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27	<i>Data analysis</i>			
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29	Number of data coders	24	How many data coders coded the data?	Methods/ Data analysis/ P7
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31	Description of the coding tree	25	Did authors provide a description of the coding tree?	Methods/ Data analysis/ P7
32				
33	Derivation of themes	26	Were themes identified in advance or derived from the data?	Methods/ Data analysis/ P7
34				
35	Software	27	What software, if applicable, was used to manage the data?	Methods/ Data analysis/ P7
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37	Participant checking	28	Did participants provide feedback on the findings?	NA
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40	<i>Reporting</i>			
41	Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results/ P9-16
42				
43	Data and findings consistent	30	Was there consistency between the data presented and the findings?	Results/ P9-16 and Discussion/ P16-20
44				
45	Clarity of major themes	31	Were major themes clearly presented in the findings?	Results/ P9-16
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47	Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Results/ P9-16
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Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.**

# BMJ Open

## How can we improve Comprehensive Geriatric Assessment for older people living with frailty in primary care and community settings? A Qualitative Study

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<b>Primary Subject Heading</b>:	Geriatric medicine
Secondary Subject Heading:	Health services research, Qualitative research
Keywords:	QUALITATIVE RESEARCH, GERIATRIC MEDICINE, Aging, Frailty

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4 1 **How can we improve Comprehensive Geriatric Assessment for older people living**  
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6 2 **with frailty in primary care and community settings? A Qualitative Study**  
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10 3 Aseel Mahmoud<sup>1</sup>, \*Victoria A Goodwin<sup>1</sup>, Naomi Morley<sup>1</sup>, Julie Whitney<sup>2</sup>, Sarah E Lamb<sup>1</sup>, Helen  
11  
12 4 Lyndon<sup>3,4</sup>, Siobhan Creanor<sup>1</sup>, Julia Frost<sup>1</sup> on behalf of the DREAM Study Team  
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31  
32 11 **Abstract**  
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35 12 **Objective**  
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37 13 With advancing age comes the increasing prevalence of frailty and increased risk of adverse  
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39 14 outcomes (e.g. hospitalisation). Evidence for Comprehensive Geriatric Assessment (CGA), a multi-  
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41 15 dimensional holistic model of care, is mixed in community settings. Uncertainties remain, such as the  
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43 16 key components of CGA, who delivers it, and the use of technology. This study aimed to understand  
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45 17 the perspectives, beliefs and experiences, of both older people and health professionals, to improve  
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47 18 the current CGA, and explore factors that may impact on CGA delivery in community settings.  
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51 19 **Design**  
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54 20 A qualitative interview study was conducted with older people and health care professionals  
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56 21 identified using a maximum variation strategy. Data were analysed using an abductive analysis  
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58 22 approach. The Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) framework  
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23 and the Theoretical Framework of Acceptability guided the categorisation of the codes, and  
24 identified categories were mapped to the two frameworks.

## 25 **Setting**

26 England, United Kingdom

## 27 **Results**

28 Twenty-seven people were interviewed, constituting 14 older people and 13 healthcare  
29 professionals (HCPs). We identified limitations in the current CGA: a lack of information sharing  
30 between different healthcare professionals who deliver CGA; poor communication between older  
31 people and their HCPs; and a lack of follow-up as part of CGA. When we discussed the potential for  
32 CGA to utilise technology, HCPs and older people varied in their readiness to engage with it.

## 33 **Conclusions**

34 Viable solutions to address gaps in the current delivery of CGA include the provision of training and  
35 support to use digital technology and a designated comprehensive care coordinator. The next stage  
36 of this research will use these findings, existing evidence and stakeholder engagement, to develop  
37 and refine a model of community based CGA that can be assessed for feasibility and acceptability.

## 38 **Keywords**

39 Ageing, comprehensive geriatric assessment, digital technology, frailty, qualitative.

## 40 **Strengths and Limitations**

- 41 • Use of qualitative interviews enabled rich data on exploration and synthesis of older people  
42 and healthcare professionals.
- 43 • Our theoretically informed qualitative research and stakeholder insights identified both  
44 challenges to the current delivery of CGA as well as opportunities for the improvement of  
45 CGA for older people with frailty.



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2  
3 46       • Our study is deliberately exploratory; thus the findings may not be transferable to other  
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5 47           older people and healthcare professionals. However, we recruited older people and HCPs  
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7 48           with a wide variety of views and experiences.  
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## 10 49 **Introduction**

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13  
14 50   Between 2020 and 2050 the number of people worldwide aged over 80 will triple to reach 26 million  
15  
16 51   (1). With ageing, people are more susceptible to develop multiple, long-term conditions that reduce  
17  
18 52   their independence and quality of life (1-4). This is due to underlying factors, such as falls, frailty, and  
19  
20 53   delirium (1, 3).

21  
22  
23  
24 54   Frailty is a clinical syndrome where multiple body systems deteriorate leading to increased  
25  
26 55   vulnerability (3, 5). Frailty increases the risk of falls, disability, hospitalisation, mortality, and contact  
27  
28 56   with healthcare services (5, 6). Prevention and reversal of frailty can enable people to stay well and  
29  
30 57   live independently for longer (3). Frailty affects half of the UK population aged over 85 and costs the  
31  
32 58   publicly funded National Health Service (NHS) £5.8 billion per year (6). A key priority of the NHS in  
33  
34 59   the UK is to support older people with frailty to manage their long-term conditions (3, 7).

35  
36  
37  
38 60   Older people living with frailty need robust interventions tailored to the complexity of their care  
39  
40 61   needs (3, 8). Comprehensive Geriatric Assessment (CGA) is a multi-dimensional diagnostic and  
41  
42 62   therapeutic intervention that includes an assessment of physical, cognitive and psychosocial  
43  
44 63   components with the development of a holistic management plan in partnership with the older  
45  
46 64   person with frailty (8). CGA delivered in acute, primary and community settings aims to prevent  
47  
48 65   deterioration and complications associated with frailty (3, 9). However, the effectiveness of CGA for  
49  
50 66   older people with frailty in primary care and community settings is mixed (8, 10, 11). Ho et al  
51  
52 67   reported benefits in terms of the likelihood of living at home, reduced mortality, improved cognition,  
53  
54 68   and activities of daily living, but with uncertain benefits on quality of life (11), whereas Briggs and  
55  
56 69   colleagues found no difference in mortality, activities of daily living, quality of life and care home  
57  
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1  
2  
3 70 admissions (8). Descriptions of CGA components often lack detail, including the delineation of staff  
4  
5 71 involved in delivery, and an understanding about factors that affect implementation are limited (12).  
6  
7  
8 72 Recent NHS initiatives to strengthen the efficiency of outpatient services using alternative  
9  
10 73 approaches require consideration. For example, there is growing interest in the use of wearable  
11  
12 74 devices to monitor patients (7). The NHS Long Term Plan, and Digital Transformation Plan,  
13  
14 75 recommend the use of digital equipment in the assessment and monitoring of older people with  
15  
16 76 frailty; with the option of using wearable devices to ensure services are inclusive and available to all  
17  
18 77 (7, 12). However, digital technologies are not part of the existing evidence for CGA.  
19  
20  
21  
22 78 Regardless of the complexity and diversity of the needs of older people with frailty, some face  
23  
24 79 inequities in access to interventions which may help to maintain or improve their independence (3).  
25  
26 80 For example, whilst telemedicine can be beneficial, cost-effective and acceptable to older people (13),  
27  
28 81 there are concerns about digital exclusion (14) and risks that important signs and symptoms could be  
29  
30 82 missed (15). Improving the effectiveness and efficiency of CGA (11) requires exploration of how  
31  
32 83 individual components may work and how the overall intervention can be enhanced. The Digital and  
33  
34 84 Remote Enhancement for the Assessment and Management of Older People with Frailty (DREAM)  
35  
36 85 project aimed to develop a community-based model of CGA that incorporated technology. This  
37  
38 86 qualitative study aimed to understand perspectives, beliefs and experiences of both actual and  
39  
40 87 potential providers and users to improve the current CGA and explore the factors that may impact  
41  
42 88 on CGA delivery in community settings, including the use of technology.  
43  
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47

## 48 **Methods**

### 51 **Design**

52  
53 91 A qualitative interview study with older people and health care professionals was conducted. AM, a  
54  
55 92 female post-doctoral research fellow and pharmacist, collected and analysed the data in  
56  
57 93 collaboration with VG (a female academic physiotherapist) and JF (a female medical sociologist). All  
58  
59  
60

1  
2  
3 94 had experience of conducting qualitative research. Ethical approval was issued by the University of  
4  
5 95 Exeter, College of Medicine and Health Research Ethics Committee (Ref 509407). The study has been  
6  
7 96 reported according to the Consolidated Criteria for Reporting Qualitative Study (COREQ) guidelines  
8  
9 97 (16).

### 98 **Patient and Public Engagement**

99 Patient Public Involvement and Engagement (PPIE) and Health and Care Professional (HCP) advisory  
100 groups contributed to the development, design and conduct of this research through a series of  
101 workshops. They contributed to developing and piloting topic guides for the interviews and provided  
102 analytical insight into preliminary findings through discussions.

### 103 **Sampling and Recruitment**

#### 104 *Older people*

105 Participants were recruited from the Community Ageing Research (CARE) 75+ (17) or the Oxford Pain  
106 Activity and Lifestyle (OPAL) (18) cohorts. Both CARE75+ and OPAL are representative, prospective  
107 longitudinal studies designed as both epidemiological studies of older people living in the  
108 community in the UK and as recruitment platforms to help overcome some of the challenges of  
109 older people being under-represented in research (19). We applied a maximum variation sampling  
110 strategy to identify Care75+ and OPAL participants who had consented to be contacted, to capture  
111 diversity in gender, ethnicity, living circumstances, socioeconomic factors, geography, frailty, sensory  
112 (e.g. visual or hearing problems), and memory problems. Frailty for the CARE 75+ Cohort was  
113 assessed using the Edmonton Frailty Index (20) and the Electronic Frailty Index (19) and for the OPAL  
114 cohort was assessed using Tilburg Frailty Indicator (21). Batches of invitations to participate were  
115 sent out to 15-20 people at a time by AM (for Care75+ participants) and the OPAL research team (for  
116 OPAL participants). In total, 132 invitations were sent out. We continued recruiting from May 2022  
117 to December 202 until our concurrent analysis yielded an in-depth understanding of where and how  
118 CGA might be improved. (22)

1  
2  
3 119 *Healthcare Professionals*  
4  
5

6 120 For healthcare professionals, we also used a maximum variation sampling strategy (23), to ensure  
7  
8 121 representation of professional background, geographical location, and gender. We invited health  
9  
10 122 and social care professionals working in non-hospital settings in the UK working with older people  
11  
12 123 living with frailty via social media (Twitter and Facebook) and via professional networks.  
13  
14

15 124 All older people and healthcare professionals who expressed an interest in taking part were  
16  
17 125 recruited.  
18  
19

20  
21 126 **Data collection**  
22

23 127 We developed semi-structured topic guides (23, 24) for older people (Additional file 1) and HCPs  
24  
25 128 (Additional file 2) based on a review of literature and online workshop discussions with our two  
26  
27 129 advisory groups made up of older people, family members, and HCPs. We did not use the term CGA  
28  
29 130 in the interviews with older people as advised by the two advisory groups. Topic domains were  
30  
31 131 aligned to the Non-adoption, Abandonment, Scale up, Spread and Sustainability (NASSS) framework  
32  
33 132 to ensure collection of rich data and to explicitly focus our analysis on how best to improve CGA (25).  
34  
35 133 The NASSS framework has previously been used to explain the interacting factors that affect the  
36  
37 134 implementation of complex interventions that utilise technology and generate mixed outcomes (25,  
38  
39 135 26). AM piloted the topic guide with members of the PPIE advisory group and refined one question  
40  
41 136 (concerning outcomes to be measured) for clarity. The topic guide enabled consistency in the data  
42  
43 137 collection, with the interviews flexible enough to allow the participants to explain what was  
44  
45 138 important to them (27). The interviews were conducted face-to-face, via telephone or video call,  
46  
47 139 depending on the participants' preference (23). AM introduced herself and explained the aim of the  
48  
49 140 study to the interviewee at the beginning of each interview. The audio-recorded interviews were  
50  
51 141 transcribed by a GDPR compliant transcriber and checked for accuracy by AM. Fieldnotes captured  
52  
53 142 the context of the interview. AM had no previous contact with any of the participants.  
54  
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60

## 143 **Data analysis**

144 We undertook abductive analysis (28), and used NVivo 13 (Release 1.7) (29) to manage the data. This  
145 involved an iterative approach to analysis, to facilitate understanding (27, 30). We coded the  
146 interviews in cycles, with deductive codes from the literature and inductive codes generated by AM,  
147 identifying similar ideas or concepts that could be categorised into a code (27, 31). This enabled  
148 balance between data relating to pre-existing concepts and data based on the perspectives of the  
149 participants (28, 32). We (AM, VG and JF) then developed a conceptual map of the different  
150 participants' perspectives (24). The NASSS framework, and the Theoretical Framework of  
151 Acceptability (25, 33) guided the categorisation of the codes. The categories were then mapped to  
152 the two frameworks, which enabled further elaboration of the complexity within the domains of an  
153 intended CGA intervention that utilises technology. For example, the broad analytical category  
154 'Organisation' was constituted by various coding categories, including person-centred and accessible  
155 records, digital enabling for staff, information sharing between HCPs and continuity of care. We used  
156 a conceptual map to create a hypothetical case (vignette) of an older person who participated in a  
157 CGA that used technology (34). We used the vignette in the final three interviews with HCPs, to  
158 extend our understanding of the potential afforded by technology. Preliminary findings were  
159 presented to the advisory groups for discussion and consideration of their interpretations.

## 160 **Results**

### 161 **Older people**

162 Fourteen older people consented to participate and were interviewed. Respondents were aged  
163 between 75 and 90 years old, were evenly split between males and females, and included  
164 participants with hearing and/or visual impairment, mobility impairments, and with one or more  
165 long term condition. One participant asked to be interviewed in the presence of their carer (a  
166 spouse). The interviews lasted between 16 and 92 minutes. (Table 1).

167 *Table 1 Demographic characteristics of older people with frailty*

Participant Pseudonym	Gender	Age group	Current residence in England	Living circumstances	Mode of interview
Robert	Male	81-85	North East	Live alone	Telephone interview
James	Male	81-85	South West	Live alone	In-person interview
Richard	Male	81-85	South West	Live with spouse	Online audio call
William	Male	86-90	North East	Live with spouse	Online video call
Barbara	Female	81-85	North East	Live with spouse	Telephone interview
Gary	Male	75-80	North East	Live with spouse	Telephone interview
Karen	Female	75-80	South East	Live alone	Online video call
Steven	Male	75-80	South East	Live with spouse	Telephone interview
Shirley	Female	75-80	Midlands	Live alone	Telephone interview
Frances	Female	86-90	South East	Live alone	Telephone interview
Carol	Female	81-85	North West	Live alone	Telephone interview
Donna	Female	81-85	South East	Live alone	Telephone interview
Frank	Male	75-80	Midlands	Live with spouse	Telephone interview
Lois	Female	86-90	South West	Live with spouse	Telephone interview

168

### 169 Healthcare professionals

170 The thirteen HCPs came from different professional backgrounds, and from different geographical  
 171 areas of England. All of the participants were working, or had worked, with older people with frailty,  
 172 for a duration of two to 30 years (Table 2). The interview duration ranged between 33 and 160  
 173 minutes.

174 *Table 2 Demographic characteristics for HCPs who participated in the study*

Participant number	Profession	Years of providing care to older people	Location in England	Gender	Mode of interview
HP1	Frailty assistant practitioner	20	South West	Female	Online
HP2	Nurse	15	South West	Male	Online
HP3	GP	Retired	North East	Female	Online

HP4	Physiotherapist	19	South West	Female	Online
HP5	GP	16	South West	Female	Online
HP6	Physiotherapist	30	South West	Female	Online
HP7	Nurse	15	South West	Female	Online
HP8	Nurse	2	South East	Female	Online
HP9	Occupational therapist	10	South East	Female	Online
HP10	Consultant Geriatrician	23	North West	Male	Online
HP11	Consultant Geriatrician	19	Midlands	Female	Online
HP12	Physiotherapist	4	Midlands	Female	Online
HP13	Pharmacist	3	North West	Female	Online

175

176 We identified patterns about the conditions to enhance CGA across the two data sets, then classified  
 177 these patterns into the eight domains of the NASSS framework and to the Framework of  
 178 Acceptability (25, 33). Here we present the four domains that were most important for both the  
 179 patient and professional participants: frailty (the condition), intended adopters (both professional  
 180 and lay), organisational factors (such as workforce challenges), and acceptability (of technology and  
 181 assessment).

### 182 **Frailty**

183 Amongst HCPs, there was an appreciation of the complexity of frailty. Regardless of whether they  
 184 have a need for acute care or not, all older people with frailty have complex needs due to having  
 185 multiple long-term conditions, impairments and/or socioeconomic factors:

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186 *“Most of them are aged 80 almost all of them are frail and so they have multiple chronic*  
 187 *conditions, they have got polypharmacy they tend to need some help with one or more*  
 188 *activities of daily living”.* (HP13, Pharmacist)

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1  
2  
3 189 HCPs from different professions tend to provide a comprehensive assessment that involves physical,  
4  
5 190 psychological and social needs for older people with acute and non-acute care needs. However,  
6  
7 191 there is a need to provide older frail people with assessment prior to a crisis developing:  
8  
9  
10

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11  
12 192 *“All the domains yeah, the psychological, physical all those you know functional,*  
13 *environmental you know do you live in a house, a flat, bungalow, do you sleep upstairs, any*  
14 *falls you know any equipment in the toilet, that kind of thing and social you know do you*  
15 *get out.” (HP12, Physiotherapist)*  
16

17  
18 196 *“So, if you’re trying to keep somebody weller for longer, then any of those proactive*  
19 *interventions rather than waiting until they get to crisis point.” (HP9, Occupational*  
20 *therapist)*  
21  
22

---

23  
24 199 We interviewed older people with frailty who were socioeconomically disadvantaged and/or  
25  
26 200 experienced sensory or physical impairment that can exacerbate the complexity of their care needs.  
27  
28 201 For example, Carol had financial challenges, restricted mobility, visual impairment, multiple long-  
29  
30 202 term conditions, and a high risk of falling. Carol had limited choices in access to care, because of her  
31  
32 203 restricted ability to travel to appointments, lack of a support network, and no access to technology:  
33  
34  
35

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36  
37 204 *“I’ve been a single person all my life and I get the basic state pension. So, I’ve never ever*  
38 *been able to afford the technology that people use every day to day in these days and*  
39 *that’s the reason I don’t have it.” (Carol, 81-85 years old)*  
40  
41

---

42  
43 207 On the other hand, Karen lived alone, but has regular communication with family and friends. During  
44  
45 208 her health and care journey, Karen was able to enact her own health decisions and avoided long NHS  
46  
47 209 waiting time for tests and referrals:  
48  
49  
50

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51  
52 210 *“I only saw the consultant yesterday, so the next steps haven’t been put in place yet.*  
53 *Unfortunately, I have had to pay privately for it and the NHS seems to be in such a mess*  
54 *and the doctor did want to send me off for tests but she couldn’t justify so, more or less*  
55 *saying well you know it is as it is we can’t do anything more for you because we haven’t got*  
56 *proof that this test or that test is something we can do, something we can justify. [...] I’ll*  
57 *have to pay for that privately otherwise I will just be waiting too long. You know I am*  
58  
59  
60



216 *getting on I don't want the last two or three years probably of my life to be sitting around*  
 217 *at home feeling sorry for myself." (Karen, 75-80 years old)*

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## 218 **Intended adopters**

219 Some HCPs indicated that an HCPs occupational background may inform the scope of assessment  
 220 during the CGA, and the quality of the CGA that they offer. A nurse who led a frailty team showed  
 221 appreciation of the range of HCP backgrounds in their team, which enabled them to involve the  
 222 most suitable HCP (e.g. in terms of their skill set), to meet the unique needs of the older person:

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223 *"obviously if it was things like their ability to perform their physical activity to daily living*  
 224 *that maybe something that I would involve one of, I've got a colleague who is Band 4*  
 225 *assistant practitioner whose got a therapy background she's very good at looking at the*  
 226 *nuts and bolts of how people physically manage [...] I will also do joint visits with OTs and*  
 227 *physios if we're feeling that we need to, that there's a, that the referral makes it sound like*  
 228 *this is very much that mixed picture of it's not just a medical requirement or a strict nursing*  
 229 *requirement that there's an overlap with where my therapy colleagues would come in".*  
 230 *(HP2, Nurse)*

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231 This contrasted consultant geriatrician (HP11) who also led a frailty team. HP11 indicated that  
 232 regardless of the different backgrounds of HCPs in their team, there should be no differences in the  
 233 CGA that they provide to older people with frailty. However, HP11 highlighted that some professions  
 234 may have limited ability to understand the complexity of older people's care needs. This was  
 235 congruent with the views from older people who thought that their care needs could be managed  
 236 better by an HCP with knowledge and experience of older people with frailty:

---

237 *"They all do the same because they've all had their advanced [...], course the advanced*  
 238 *assessment healthcare assessment course. They've all done the same course ok,". (HP11,*  
 239 *Consultant Geriatrician)*

240 *"You could have one doctor who is in the practice who specialised in old people you know*  
 241 *just for the aged to sort of he specialised in the aged. [...] where old people could feel they*  
 242 *could go [...] rather than a general practitioner maybe somebody that was for the old and*  
 243 *the frail." (Barbara, 81-85 years old)*

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1  
2  
3 244 A GP (HP3) thought that the ability to deliver CGA depends upon the investigative and  
4  
5 245 communication skills, and previous experience of staff, and it is not restricted to a particular  
6  
7 246 background:  
8  
9  
10

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11  
12 247 *“So, I tend to work on a concept that I don’t like thinking about professions doing things I*  
13 248 *like to think about competencies.” (HP3, GP)*  
14  
15

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16  
17 249 Some HCPs suggested that HCPs may require training to improve interpersonal skills, in terms of  
18  
19 250 communication and attention to detail, to ensure enhancement of CGA. For example, HP12 (a  
20  
21 251 Physiotherapist) shared their personal experience of developing their investigational skills when  
22  
23 252 providing remote CGA over time. HP7 (a Nurse) shared their experience of supporting new HCPs in  
24  
25 253 their team to learn how to pick-up non-verbal cues during home visits, to support identifying care  
26  
27 254 needs and provide CGA.  
28  
29

### 30 255 **Organisation**

31  
32  
33 256 Interviewing HCPs from different geographical areas of England allowed us to explore organisational  
34  
35 257 limitations, which would require innovation to increase readiness for new forms of technology-  
36  
37 258 informed care delivery.  
38  
39

40  
41 259 Some HCPs made references to fear and resistance to trying new ways of care delivery. For example,  
42  
43 260 a nurse (HP2) referred to themselves as ‘a dinosaur’ when it comes to trying new technologies.  
44  
45 261 Similarly, a frailty assistant practitioner (HP1) also indicated that practitioners may need support  
46  
47 262 from colleagues, while a consultant geriatrician (HP11) shared the challenges they had when using  
48  
49 263 technology and the time needed for training to use new technology:  
50  
51

52  
53  
54 264 *“There’s also the training aspect of it. Training takes a long time you go in and sit down and*  
55 265 *have training whatever new technology comes you have to find time to go for training and*  
56 266 *you actually don’t get to understand its use until you start using it and the problems that*  
57 267 *you get when you start using it”.* (HP11, Consultant Geriatrician)  
58  
59

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1  
2  
3 268 Almost all HCPs discussed the negative impact of using different clinical databases in various settings  
4  
5 269 on their ability to share and/or access patients' records. HCPs discussed the importance of having a  
6  
7 270 well-established information sharing process between HCPs in different settings in enhancement of  
8  
9  
10 271 CGA. HCPs shared their experiences of meeting the challenges in information sharing. For example,  
11  
12 272 sharing data in regular Multi-Disciplinary Team (MDT) meetings, provides access to the GP medical  
13  
14 273 records for HCPs who work in the community, which enables them to effectively support the older  
15  
16 274 people with whom they work. Some organisations have a sharing document that all HCPs involved in  
17  
18  
19 275 CGA can use to input and share data, which staff found beneficial in terms of the availability of  
20  
21 276 information and efficiency in obtaining key information when needed:  
22  
23  
24

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25  
26 277 *"I've not seen they've had a CGA, their clinical frailty scale is this, blah, blah, blah never*  
27 278 *seen it never ever. Never ever, ever seen it. So, information is not coming it is not flowing".*  
28 279 *(HP12, Physiotherapist)*

29  
30  
31 280 *"I just from previous experience I knew these sorts of things I needed to have so I made*  
32 281 *sure that I discussed it with the CCG and got them to put this in place because I didn't want*  
33 282 *to be spending exactly like the nurse, two hours, trying to get information when in five*  
34 283 *minutes I can have that information."* (HP10, Consultant Geriatrician)

35  
36  
37 284 *"So, for me to be able to know what medicines somebody is on, I have to have access to*  
38 285 *that or I've got ask somebody who has access to check for me ok".* (HP11, Consultant  
39 286 *Geriatrician)*

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40  
41  
42 287 Lack of staff capacity was perceived as a limitation for delivering CGA by all HCPs, which may inhibit  
43  
44 288 delivery of timely support which an older people may require. Some older people recognised the  
45  
46 289 limited staff availability and the increasing demands on the GP practices that inhibit continuity in  
47  
48  
49 290 care. For them, lack of continuity decreases their engagement with their care:  
50  
51  
52

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53  
54 291 *"More of us, more availability [...] I mean we are running its sort of like a virtual ward model*  
55 292 *but it's going to be, we have less staff on at a weekend. So, our capacity to take new*  
56 293 *referrals on a Friday and over the weekend is a lot less."* (HP9, Occupational therapist)  
57  
58  
59  
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294 *“When you see the doctor, you know you barely it’s a locum that I see I don’t see my own*  
295 *doctor.” (Shirley, 75-80 years old)*

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296 Other older people with frailty understood the current workforce challenges in the NHS and  
297 suggested that improved communication between HCPs and sharing information may mitigate the  
298 current lack of continuity:

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299 *“GPs talk to each other and that you know if you go in and you see somebody who is not*  
300 *your designated GP you know that fine well that the notes are there [...]. So, you feel*  
301 *perfectly happy that you know whoever you are seeing, knows what they are talking*  
302 *about.” (Lois, 86-90 years old)*

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303 However, we identified that when an older person can identify a key contact person to support  
304 them, this can mitigate a lack of continuity in their care, because they key person can co-ordinate  
305 their care and ensure the continuous flow of communication:

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306 *“So, I sort of stayed involved in this case as a coordinating factor because you know it*  
307 *happens when too many people are involved things the outcome might not be good or the*  
308 *people can get lost in translation and so I managed to speak to the mental health team and*  
309 *everything and draw all the people that the GP had referred to, to a point where I said now,*  
310 *you need to take this forward.” (HP12, Physiotherapist)*

---

### 311 **Acceptability**

312 We identified elements that might influence acceptability by older people with frailty, that should be  
313 taken into consideration when enhancing CGA.

314 Although HCPs perceived that older people were satisfied with CGA and the care provided to them,  
315 some older people indicated that they could not freely communicate with HCPs and express their  
316 needs, because of perceived short appointments with their GP. Furthermore, older people lacked  
317 trust in their HCPs, or the clinical decisions made about their treatment plan:

1  
2  
3  
4 318 *"I would say the consistent feedback is normally that they're greatly relieved that we've*  
5 319 *given the time 'cos we don't time specify our visits" (HP2, Nurse)*

6  
7  
8 320 *"No, it's so quick and it's so, I mean in person, well I wouldn't say personal you know when*  
9 321 *you speak to a doctor like I did with my old doctor if he, it was just a different attitude*  
10 322 *towards you, it's like a conveyor belt, you come in, you go out, you come in and you go out*  
11 323 *so, you know you just feel it's not the same what it was before." (Shirley, 75-80 years old)*

12  
13  
14 324 Moreover, HCPs acknowledged the variation in older people readiness to engage with new ways of  
15  
16 325 care delivery:

17  
18  
19  
20  
21 326 *"There is a high risk of inequalities because anytime you are going introduce something*  
22 327 *different new, there are going to be people who can use it very easily and there are going*  
23 328 *to be those who can't for whatever reasons". (HP13, Pharmacist)*

24  
25  
26  
27 329 This aligned with the findings from interviews with the older people themselves. For example, Karen  
28  
29 330 showed readiness to engage with new ways of receiving technology-informed care because she had  
30  
31 331 previous experience of using technology in her healthcare, and in communication with family  
32  
33 332 members. In contrast, Shirley rejected engagement with new forms of remote appointments:

34  
35  
36  
37  
38 333 *"They did ask me once yes, but I said, well, I don't know how to do it, let's put it that way a*  
39 334 *video appointment I mean I don't [...] I have a mobile phone so, you know I just don't know*  
40 335 *how to do it. So, the other solution was that they speak to me over the phone". (Shirley, 75-*  
41 336 *80 years old)*

42  
43  
44  
45 337 Lack of physical access to technology (e.g. a device or internet connection) can inhibit an older  
46  
47 338 person's opportunity to learn how to use technology, which may subsequently limit their readiness  
48  
49 339 to engage with new forms of technology informed care. Therefore, those with frailty may require  
50  
51 340 additional support to engage with CGA that utilises technology. For example, older people with  
52  
53 341 sensory impairment may require specialist adaptation to their device, or support from a carer to  
54  
55 342 engage; whereas older people who are already digitally literate may only need educational input on  
56  
57 343 how to use a new technology.  
58  
59  
60

1  
2  
3 344 HCPs recognised the variation in the needs and preferences of older people with frailty and  
4  
5 345 discussed how they tailor CGA to the person's needs:  
6  
7  
8

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9  
10 346 *"I would say we're able to be very person-centred we're not looking at things from a*  
11 347 *clinician's perspective only we will explore things from the patient's perspective in terms of*  
12 348 *what they think is their problems."* (HP4, Physiotherapist)  
13

---

14  
15 349 Some HCPs thought that the presence of a carer, a family member or support network may increase  
16 350 a frail older person's acceptance of CGA that utilises technology. However, HCPs acknowledged the  
17  
18 351 higher demands on the carer which may reduce the support they can provide, to help the older adult  
19  
20 352 engage with technology. A GP (HP3) shared examples of caregivers who inadvertently disempower  
21  
22 353 the older person, in terms of decision-making about their healthcare choices. Older people may  
23  
24 354 therefore require support from a wider network, and not only their carer:  
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30  
31 355 *"Some of them have families who help them but they still like you know eye contact,*  
32 356 *physical contact and the written word, you know paper, hard copy of anything. So, I am*  
33 357 *afraid that's something that they'll eventually all pop off but and thankfully the younger*  
34 358 *ones are you know quite capable of using all these devices."* (Barbara, 81-85 years old)  
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37  
38 359 HCPs may not be able to provide the required follow-up after an assessment, important for tracking  
39  
40 360 the referrals to other services if needed and the management plan provided to the patient. Similarly,  
41  
42 361 older people explained the challenges that they were facing in following-up the HCPs; for example,  
43  
44 362 to find out the result of a test, or to book an appointment:  
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48  
49 363 *"I would like to think we're good at going out and identifying the problem we're good at*  
50 364 *negotiating a management plan with someone it's then how do you monitor the effect of*  
51 365 *that management plan"*. (HP2, Nurse)  
52  
53

54 366 *"I had to phone my practice after I'd been to see the 111 doctor and she said get in touch*  
55 367 *with your practice and I got this sort of non-committal reply oh, well you'd better start your*  
56 368 *antibiotics and I was quite disappointed that they didn't get in touch with me because*  
57 369 *they'd given me that advice without having seen a report and I thought well I would have*  
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3 370 *expected something to come back but like I said, I was really not well enough to do*  
4 371 *anything about it". (Donna, 81-85 years old)*  
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## 8 372 **Discussion**

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11 373 This study explored the factors that may impact on CGA delivery in community settings, including  
12  
13 374 the use of technology. This research adds to the current growing evidence on challenges on  
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15 375 delivering effective CGA in community settings and identified factors to enhance CGA in community  
16  
17 376 settings from the perspectives of older people and HCPs.

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21 377 In this study, we identified key challenges to the enhancement of CGA in the community, including:  
22  
23 378 information sharing between different HCPs who are delivering the CGA; communication between  
24  
25 379 older people and their HCPs; and follow-up appointments after conducting the CGA. From the  
26  
27 380 current challenges that were explained by participants, and suggestions which they made to address  
28  
29 381 them, workshop discussions with advisory group members and existing literature, we identified  
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31 382 factors to enhance CGA in the community.

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35 383 Both HCPs and older people considered that the delivery of CGA should not be limited to those from  
36  
37 384 specific professions but should be based upon HCPs competency and knowledge of the complexity of  
38  
39 385 need for older people with frailty. This finding aligns with the Ageing Well Network of Enhanced Care  
40  
41 386 for older People (EnCOP) competency framework (35); an aim of which is to enhance staff  
42  
43 387 competency in working anywhere in the care system (35). The Health Education England and NHS  
44  
45 388 England commissioned the Frailty Core Capabilities Framework in 2018 to identify skills and  
46  
47 389 behaviours required to deliver high quality of care to older people with frailty (36). However, there is  
48  
49 390 limited use of the framework in commissioning education or training, reflected in the results of  
50  
51 391 evaluation surveys that were conducted in 2018 and 2019 (37). We suggest that upskilling staff and  
52  
53 392 providing them with appropriate training to improve their communication and investigation skills  
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55 393 may be a viable solution to mitigate the negative impact of workforce shortages on the effectiveness  
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57 394 of CGA.  
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3 395 From conducting interviews augmented by workshop discussions with advisory group members, we  
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5 396 identified the need for assigning a member of staff or MDT team to a co-ordinating role, which we  
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7 397 designated as “Comprehensive Care Coordinator”. This person could coordinate the delivery of CGA  
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9  
10 398 by facilitating information sharing between different HCPs, communicating with older people with  
11  
12 399 frailty on a regular basis, and ensuring that the management plan including referrals is acted upon.  
13  
14 400 Designating a care coordinator may improve continuity of care with one point of contact and provide  
15  
16 401 reassurance through a therapeutic, long-term relationship. This may provide reassurance to the  
17  
18 402 older person and ensure effective follow-up of any management plan. Care coordinator roles in the  
19  
20 403 community, including case managers, may reduce emergencies. However, evidence shows variation  
21  
22 404 in the role in different studies in terms of duration and frequency of home visits and HCPs who  
23  
24 405 coordinated the care (11, 38, 39). Further research needs to identify who could best coordinate care  
25  
26 406 in older people and what the best approach may be.  
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29  
30 407 Moreover, HCPs agreed that utilising technology in the delivery of CGA may enable HCPs to provide  
31  
32 408 support for older people without compromising their follow-up. The NHS plan highlighted the need  
33  
34 409 for enhancing the use of technology in healthcare, to change how care is being provided to patients;  
35  
36 410 and to create joined up computer systems that give staff sufficient access to data, to provide  
37  
38 411 improved care for patients (7). However, there is a need for digital upskilling of staff to support their  
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40 412 effective use of technology in healthcare (40).  
41  
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43  
44 413 Different IT-systems and a lack of information governance arrangements across different settings  
45  
46 414 currently inhibits information sharing and creates tension between HCPs in different settings. HCPs  
47  
48 415 told us that the lack of connection between different systems must be addressed, if they are to  
49  
50 416 deliver an effective CGA. Similarly, older people mentioned how lack of access to information  
51  
52 417 magnified unequal access to effective CGA, and support and care for older people with frailty. In  
53  
54 418 February 2023, NHS Digital became responsible for digital technology, data and health and care  
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56 419 delivery. This has the potential to address some of the challenges in information sharing (41).  
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3 420 Existing research has identified the need for convenient platforms and improved digital records for  
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5 421 integrated care services for older people (including CGA) that maintain privacy and security when  
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7 422 sharing patient data between MDTs (40, 42). Such integrated platforms may enhance  
8  
9 423 communication and coordination of care (40, 42). However, resolving existing operational  
10  
11 424 complexities is likely to require additional funding and the creation of interoperable IT-systems (7,  
12  
13 425 40, 41, 43).

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16  
17 426 We found that socioeconomic factors, including living circumstances, income, and social network  
18  
19 427 impacted older peoples' treatment choices; in terms of whether they visited a clinical specialist and  
20  
21 428 waiting times for NHS appointments. This implies that when developing the CGA that utilises  
22  
23 429 technology we need to consider how to mitigate socioeconomic factors that inhibit access and  
24  
25 430 capacity to obtain the benefits of using digital equipment in the assessment and follow-up. Existing  
26  
27 431 research suggests that digital interventions are less effective in populations with socioeconomic  
28  
29 432 disadvantage compared with those with higher socioeconomic status (44). Although the COVID 19  
30  
31 433 pandemic accelerated the shift to online resources and services, and changed patient perceptions  
32  
33 434 and willingness to use technology, it increased digital inequalities (45, 46). Amongst those aged 75  
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35 435 and over in the UK, 42% do not use the internet, reporting a lack of digital skills as the main  
36  
37 436 reason (47). However, the older population is changing, and the next generation of older people are  
38  
39 437 more familiar with using technology, with 77% of those aged over 55 using a smart phone (48) and  
40  
41 438 55% of those aged 50-64 using the internet most days (47). However, increasing physical access to  
42  
43 439 connected devices and the internet alone may not be enough to reduce inequalities in access to CGA  
44  
45 440 that utilises technology (44, 45, 49). Therefore, training and support would be needed to ensure  
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47 441 older people could be digitally enabled; however, this may not be appropriate for everyone, and  
48  
49 442 support would need to be individualised (47).

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56 443 Using technology for monitoring and supporting older people with frailty is an NHS priority, and over  
57  
58 444 time there may be more opportunities for older people with frailty to access and use technology (7).  
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3 445 Research now needs to assess if these changes positively affect older people with frailty, support  
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5 446 engagement with CGA that utilises technology, and whether they diminish inequalities in access to  
6  
7 447 technology informed care.  
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9

10 448 Qualitative interviews enabled exploration and synthesis of older people and HCPs perspectives.  
11  
12 449 Although we recruited a range of older people and HCPs with a wide variety of views and  
13  
14 450 experiences, our findings may not be transferable to all older people and HCPs who have different  
15  
16 451 experiences or perspectives (e.g. we were unable to recruit any social workers despite employing  
17  
18 452 several strategies) (24, 27). However, our theoretically informed qualitative research and  
19  
20 453 stakeholder insights identified both challenges to the current delivery of CGA as well as  
21  
22 454 opportunities for the improvement of CGA for older people with frailty.  
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## 26 455 **Conclusions**

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30 456 We identified four factors to enable implementation of CGA in community: enhancing staff  
31  
32 457 competency in working with older people with frailty, creating interoperable IT-systems, assigning a  
33  
34 458 care coordinator for older people with frailty, and mitigation of the impact of inequalities in access  
35  
36 459 to digital care. Introducing technology and a designated comprehensive care coordinator may be  
37  
38 460 vital to addressing gaps in the current provision of CGA. These solutions may also positively affect  
39  
40 461 the acceptability of CGA in older people with frailty. The next stage of this research will further  
41  
42 462 develop, refine and test a model of improved CGA in community setting.  
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## 590 **Authors' Contributions**

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35  
36 591 VG and JW conceived the ideas for the research with the help of JF and SL. AM collected the data.  
37  
38 592 AM, JF and VG analysed the data. AM led the writing with the help of JF and VG. NM, HL, SL and SC  
39  
40 593 critically revised the manuscript. All authors have approved the final version of the article.  
41  
42

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53 598 of Health and Social Care.  
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3 599 **Conflict of interests**  
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6  
7 600 None.  
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10 601 **Ethics approval and consent to participate**  
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13 602 All the participants gave written informed consent and consent to participate. Ethical approval was  
14  
15 603 issued by the University of Exeter, College of Medicine and Health Research Ethics Committee (Ref  
16  
17 604 509407).  
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19

20  
21 605 **Consent for publication**  
22  
23

24 606 The participants gave their consent to participate in the study and to publish anonymised quotes  
25  
26 607 from the interview transcripts. The names of the participants have been anonymised.  
27  
28

29 608 **Availability of data and materials**  
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33 609 Supplementary data mentioned in the text are available in the additional files.  
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36 610 **Additional files**  
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40 611 Additional file 1 contains topic guide for interviews with older people.  
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43 612 Additional file 2 contains topic guide for interviews with HCPs.  
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## Topic guide –Older people and carers

1 **Researcher to introduce self, ask why participant interesting in taking part and orientate then as to what they will be**  
 2 **discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.**  
 3

Topic	Prompts
<b>Background (NASS Domain Frailty)</b>	
Could you tell me a bit about yourself and what is important to you in your life /lives?	Who they are? Where they live? What do they do? Support networks
Does your health or personal situation impact on what is important to you?	How? why?)
<b>Appointments with health and care staff (NASS Domains CGA, Organisation, Intended adopters and Embedding)</b>	
Please can you think back to a recent appointment with a health or social care professional (such as a Dr or nurse), and tell me about what happened in that appointment	Thinking about things like asking questions, checking your ability to do something, or taking any measurements? Did you get the chance to say anything such as what is important to you
What did you think about how that appointment was conducted?	Whether they would have liked anything to have been done differently, or not done at all? what you would have liked to have happened? And why?
If an appointment went well, what were the things that were done, that made that a positive experience for you?	Anything that could have been done differently?
Are you able to give me any examples of how the pandemic has changed how you engage with health and care staff?	What has worked well for you? What hasn't worked so well?
<b>Thinking ahead (NASS Domain Technology)</b>	
<p>We are exploring different ways health and care professionals might conduct appointments with older people or find out about a person's health. I am going to ask you your thoughts about different ways they could do this:</p> <ul style="list-style-type: none"> <li>• What do you think about appointments being done remotely; for example by telephone or video?</li> <li>• What do you think about using different ways of sharing information on their current health with staff; for example filling out questionnaires?</li> <li>• What do you think about using equipment that collects information about your health, for example taking your own blood pressure and sending results to your GP?</li> <li>• What do you think about using a mobile phone to share information about how you are doing; for example, a weekly phone check-in with health or care staff?</li> <li>• What do you think about using wearable technology, for example a pedometer or fitbit that collects data about your movement or exercise?</li> </ul>	What informs their thinking, any preferences, concerns or worries? Can you think of any other older people for whom these might not be appropriate, could they make things worse, What sort of problems may pose particular challenges? Could these be helpful or beneficial to older people? What might be needed to use effectively?
For those who might struggle with technologies, can you think of ways in which staff can best support them to ensure they can still access to the best possible care? <b>(NASS Domains-Embedding)</b>	Who might struggle?
If we want to set up a new way of doing appointments using technology, what should we measure to see if the new way works? <b>(NASS Domain-Value Proposition)</b>	

58 Is there something else that I have not asked you about, that you would like to tell me about your health and healthcare?  
 59  
 60

Thank you.  
 DREAM

## Topic guide –Staff

**Researcher to introduce self, ask why participant interesting in taking part and orientate them as to what they will be discussing. Reminder re: confidentiality. They can pause, stop, or withdraw at any time.**

Topic	Prompts
<b>Background (NASS Domain Frailty and CGA)</b>	
Please can you tell me a bit about your professional background and current role?	How long and it what capacity have you been working with older people? Describe the setting you work in.
Please can you tell me a bit about the older people that you work with and the kinds of things that you do with them in consultations	Asking them questions, checking their ability to do something, or taking any measurements?; do you do things differently if they are acutely unwell vs proactive/preventative care; how do you tailor assessments and care to meet individual needs/what is important to them
<b>Current assessments (NASS Domains CGA, Organisation, Intended adopters and Embedding)</b>	
What do you think older people/carers think about what you assess and how you conduct assessments (CGA)	Do you think that they might like anything to be done differently, or not done at all?
If a consultation goes particularly well, what is it that you have done, that might have made that a positive experience for them?	Is there anything that you might do differently? If yes: can you please describe in what circumstances you might do this? And why?
Are you able to give me any examples of how the pandemic has changed how you engage with older people specifically?	What has worked well for you? and what hasn't worked so well
<b>Thinking ahead (NASS Domain Technology)</b>	
Can you think of any ways in which you might be able to undertake more effective assessments with older people?	What are they hoping to achieve? What is stopping them?
One way that assessments might be undertaken different, is by them being undertaken remotely or by using different types of technology, and I am going to ask you your thoughts on some examples: <ul style="list-style-type: none"> <li>• What do you think conducting assessments with older people remotely; for example by telephone or video?</li> <li>• What do you think about using different ways that older people might share their information with you; for example filling out questionnaires?</li> <li>• What do you think about using equipment that collects older people's information, for example taking their own blood pressure and sending to you, you will have access to the results?</li> <li>• What do you think about older people using a mobile phone to share information about how they are doing with you; for example, a weekly phone check-in with healthcare staff?</li> <li>• What do you think about older people using wearable technology, for example a pedometer or fitbit that collects data about their movement or exercise?</li> </ul>	Prompt as to what informs their thinking, any preferences, and concerns or challenges eg any people/groups that not appropriate for/make things worse? How do you avoid inequalities in access to care  When might these be helpful or beneficial to older people? What might they need to engage effectively
If we were to evaluate a new intervention for older people or, what do you think that we should measure to see if it works? <b>(NASS Domain-Value Proposition)</b>	How could we measure the impact of a new intervention?

Is there something else that I have not asked you about, that you would like to tell me about?

**Thank you**



## COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Section/Page No.
<b>Domain 1: Research team and reflexivity</b>			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Methods/Design/ P4
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	Methods/Design/P4
Occupation	3	What was their occupation at the time of the study?	Methods/Design/P4-5
Gender	4	Was the researcher male or female?	Methods/Design/P4
Experience and training	5	What experience or training did the researcher have?	Methods/Design/ P4-5
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	Methods/Data collection / P6
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Methods/Data collection / P6 and additional files 1 and 2
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Methods/Design/ P4
<b>Domain 2: Study design</b>			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods/ Data collection and Data analysis/ P6, P7
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods/Sampling and recruitment/ P5
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods/Sampling and recruitment/ P5
Sample size	12	How many participants were in the study?	Results/older people and Healthcare professionals/ P7-9
Non-participation	13	How many people refused to participate or dropped out? Reasons?	Methods/Sampling and recruitment/ P5
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Methods/Data collection/ P6
Presence of nonparticipants	15	Was anyone else present besides the participants and researchers?	Results/older people/ P7

1	Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Results/older people and Healthcare professionals/ P7-9
2				
3				
4	<i>Data collection</i>			
5	Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods/ Data collection/ P6
6				
7	Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	NA
8				
9	Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Methods/ Data collection/ P6
10				
11	Field notes	20	Were field notes made during and/or after the inter view or focus group?	Methods/ Data collection/ P6
12				
13	Duration	21	What was the duration of the inter views or focus group?	Results/older people and Healthcare professionals/ P7-9
14				
15	Data saturation	22	Was data saturation discussed?	Methods/Sampling and recruitment/ P5
16				
17	Transcripts returned	23	Were transcripts returned to participants for comment and/or	NA
18				
19				
20				
21	<b>Topic</b>	<b>Item No.</b>	<b>Guide Questions/Description</b>	<b>Reported on Page No.</b>
22				
23			correction?	NA
24				
25	<b>Domain 3: analysis and findings</b>			
26				
27	<i>Data analysis</i>			
28				
29	Number of data coders	24	How many data coders coded the data?	Methods/ Data analysis/ P7
30				
31	Description of the coding tree	25	Did authors provide a description of the coding tree?	Methods/ Data analysis/ P7
32				
33	Derivation of themes	26	Were themes identified in advance or derived from the data?	Methods/ Data analysis/ P7
34				
35	Software	27	What software, if applicable, was used to manage the data?	Methods/ Data analysis/ P7
36				
37	Participant checking	28	Did participants provide feedback on the findings?	NA
38				
39				
40	<i>Reporting</i>			
41	Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results/ P9-16
42				
43	Data and findings consistent	30	Was there consistency between the data presented and the findings?	Results/ P9-16 and Discussion/ P16-20
44				
45	Clarity of major themes	31	Were major themes clearly presented in the findings?	Results/ P9-16
46				
47	Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Results/ P9-16
48				
49				
50				

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.**