SIGNANT HEALTH

eBOOK

ELECTRONIC PATIENT REPORTED OUTCOME (ePRO) MEASURES AND OLDER PEOPLE: PROOF THAT AGE IS JUST A NUMBER

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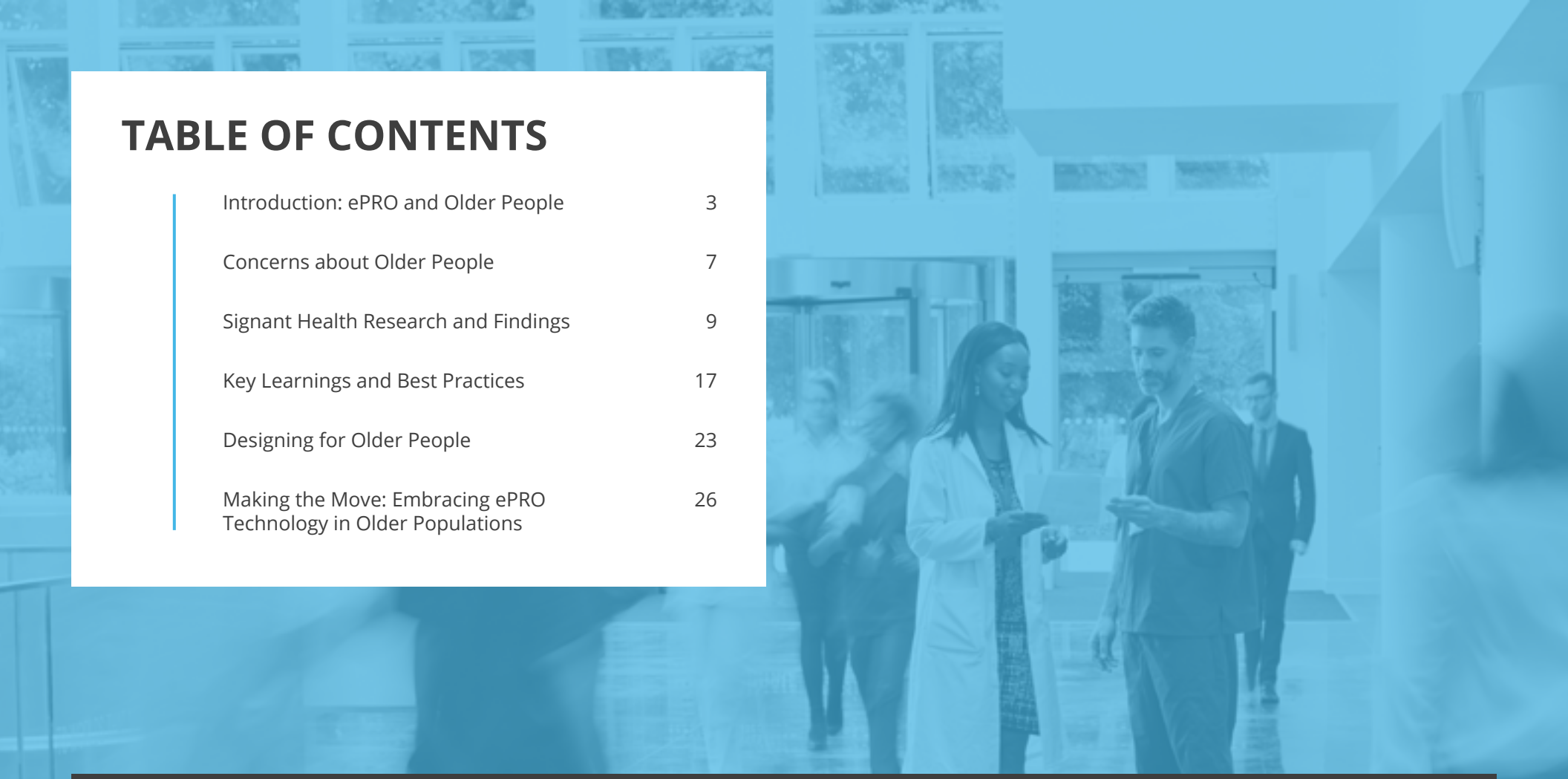
TABLE OF CONTENTS



The clinical trial industry is adopting technology to improve the efficiency and quality of trials, including electronic clinical outcome assessments and specifically, electronic patient-reported outcome assessments (ePRO). ePRO is now an accepted method of data collection in clinical trials, however, sponsors sometimes ask whether older people can manage electronic data collection. Signant Health undertook qualitative research to understand more about older people and their interactions with technology.

Our research found that the younger group of older individuals had similar experiences and attitudes toward mobile technology devices as the rest of the population and while the older participants expressed some reluctance toward unfamiliar technology, all participants were using technology and accepting of it. This eBook will describe Signant Health's research and set out recommendations, provide an overview of best practices for ePRO in older people and offer considerations for implementation. The full article of this research is published in the Journal of Comparative Effectiveness.[1]

INTRODUCTION: ePRO AND OLDER PEOPLE

A patient-reported outcome (PRO) measures a patient's perception of their symptoms, mental state, or the effects of a disease, condition or medical treatment as reported by the patient themselves. Some are difficult to measure in other ways, such as pain intensity, nausea, moods or feelings, but understanding the patients' perceptions of how interventions affect them is a vital component of assessing new treatments. Today's regulatory guidelines strongly encourage clinical trial sponsors to adopt electronic means of capturing patient and clinician reported outcomes over traditional paper questionnaires and eCOA (electronic clinical outcome assessment) is now a widely accepted method of data collection in trials.

WHY IS eCOA IMPORTANT?

eCOA employs technology such as smartphones, tablets or personal computers to allow patients, clinicians, and their caregivers to directly report clinical outcomes. Electronic collection is associated with greater data quality and integrity in comparison to pen and paper, and this allows for a better understanding of the patient experience in clinical trials and ultimately helps simplify the path to approval. Additionally, eCOA solutions are designed to support the patient throughout the trial, such as prompting them if they miss a question or sending a reminder to alert them to make a diary entry.

While older people have successfully used ePRO applications in clinical studies[2,3], some clinical trial practitioners remain concerned that older populations will not be capable of managing electronic data collection. Typical questions raised by clinical trial sponsors and study teams involved in trials with older people include general concerns related to mobile technology experience and confidence and specific concerns related to physical challenges such as deteriorating eyesight. The concern raised most often is perceived lack of familiarity and proficiency with mobile technology.

WHY IS THIS POPULATION IMPORTANT?

Older people form a significant segment of the clinical trial population and this importance is set to grow. Populations around the world are rapidly aging. From 2000 to 2050, the world's population aged 60 and over will more than double with absolute numbers of 900 million in 2015 to 2100 million in 2050.[4]

Since the population is aging, the size of this population will grow faster compared to other age groups. In addition, the eCOA market is predicted to grow as the benefits of completeness of data, timeliness, accuracy and attributability are realized and regulators strengthen their recommendations with regard to electronic data collection.[5]

Older users can be involved in trials across the spectrum of therapeutic areas but some common indications that are particularly relevant for older people include rheumatoid and osteo- arthritis, type II diabetes, respiratory conditions such as Chronic Obstructive Pulmonary Disease, cancer, cardiovascular conditions, and central nervous system diseases such as dementia.

The effect of drugs should be studied in all age groups. Poor representation of older patients in clinical trials leads to inadequate evidence and knowledge regarding drug therapy in older populations.[6] Regulatory bodies such as the European Medicines Agency (EMA) and the Food and Drug Administration (FDA) play an important role in protecting the health of citizens, including older people. Recognizing the importance of fair inclusion and being mindful that the older generation are the fastest growing sector of the population, regulators and other organizations work hard to ensure that older people are not excluded from clinical research.

One group active in this field is PREDICT (Increasing the Participation of the Elderly in Clinical Trials), a consortium funded by the European Union to study the participation of older people in clinical trials and propose ways of boosting recruitment. Many guidelines and recommendations, including those issued by the Food and Drug Administration (FDA) state that technology should not be a barrier to taking part in a clinical trial, however they do advocate the wider use of mobile technologies.

DEFINING AN OLDER PERSON

There is no formal definition of an older person. It is generally considered to be a person 'who has reached a certain age.' This age varies among cultures but is often associated with the age of normal retirement. In the Western world, this is around the age of 65. The WHO, refers to people over the age of 60 in reference to older people.[7]

CONCERNS ABOUT OLDER PEOPLE USING ePRO

There is sometimes a perception that older patients will be unable to use ePRO systems. Signant Health has noted that some sponsors and study teams have raised general concerns such as:

"How will older people manage in the trial?"

"The older population simply won't use it."

They have also mentioned the following specific concerns:

CONCERN	OUTCOME
Deteriorating eyesight	Difficulty getting to site and difficulty reading the text associated with PRO assessments
Reduced hearing	Difficulty hearing at site visits or hearing diary reminder alarms at home
Lack of digital proficiency	Lack of confidence or ability with technology which may lead to poor ePRO compliance
Difficulty with recall / memory	Difficulty remembering to visit the site and complete assessments and forgetting to complete questionnaires at home
Low tolerance to fatigue	Difficulty completing long or complex assessments
Difficulties with dexterity	Difficulty holding a device and selecting responses using a touch screen
Reduced mobility	Difficulty getting to site to complete assessments

CONCERNS SUCH AS LACK OF CONFIDENCE WITH TECHNOLOGY ARE SPECIFIC TO EPRO BUT MANY OF THESE CONCERNS APPLY EQUALLY OR PERHAPS MORE SIGNIFICANTLY TO COMPLETING PROS WITH PEN AND PAPER AND TO TRADITIONAL CLINICAL TRIAL PROCESSES.

SIGNANT HEALTH RESEARCH AND FINDINGS

We undertook qualitative research to help us understand more about older people and their interactions with mobile technology.

The aims of the study were to qualitatively investigate the experiences and attitudes of older people toward mobile technology (smart phones, feature phones, tablets); and to use the data to generate recommendations on ePRO usage for older trial participants and conductors of clinical trials.

RESEARCH METHODS

An interview guide was prepared by the user experience team at Signant Health in order to explore three high level areas:

- Experience and considerations relating to using electronic and touchscreen media.
- Attitudes towards remote clinical consultations and whether these can be undertaken effectively. Remote consultations include telephone or video consultations where the patient and clinician do not physically meet in the same place.
- Preferred aspects of a learning experience, and what tends to make a learning process difficult or easy.

Participants were recruited from a community and social group for older people in the UK. The research project was described to members at a meeting and volunteers were invited to be interviewed.

The study aimed to recruit participants of both sexes over the age of 60. The sample was supplemented with participants recruited via personal networks. The participants were interviewed either face-to-face or over the telephone by an experienced qualitative interviewer and each interview lasted between 30 min and 1 h. Participants were also asked about their eyesight, hearing and dexterity to put their answers into context and to assess how much of a challenge these problems can be.

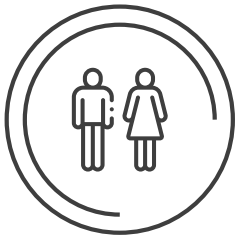
Interview findings were coded in Word and then the findings were grouped into themes in Excel.

Key quotations were extracted from the interview notes.

RESEARCH FINDINGS: GENERAL

Respondents were aged between 65–83 years

Mean age was 72.6 years



Respondents were male and female

100% of the participants reported some physical limitation

Deteriorating eyesight was reported by all participants. However, they all had their sight corrected with glasses and many knew how to increase the size of the text on their mobile devices

"If the text is small, I enlarge it especially when my eyes get tired and blurry. The enlarging function is useful."
Age 70

30% of the participants reported some hearing difficulties

None of the sample reported significant dexterity challenges

Other physical challenges reported included the loss of one eye, age-related macular degeneration and Type 2 diabetes

CURRENT MOBILE TECHNOLOGY USE

Age is not the most important factor in terms of interacting with technology, it is more likely to be general health and attitude. The younger group of older individuals had similar experiences and attitudes towards touchscreen devices as the rest of the general population. This group had a positive attitude towards technology.

- Touchscreen devices were being used by 90% of participants
- All participants had a mobile phone
  - 70% had a smartphone
  - 30% had a feature phone (a mobile phone with buttons and no touchscreen that doesn'tt connect to the internet)
- The feature phone users were all aged 75 and over
- 70% reported having a tablet device
- Some participants said that they found tablet devices easier to use and easier to read from than mobile phones because they were bigger
- 80% said that they found their mobile devices easy to interact with. One participant said they found it 'okay' and would increase the size of the text if it was too small. One said that they sometimes found it hard to read toward the end of the day once their eyes were tired
- All of the participants had an internet connection at home
- None of the participants reported problems with charging devices although one participant (age 83) stated that they sometimes forget and couldn't always find the charger

  "Do you have any devices that need to be kept charged and how easy is that?"

  "No problems. I have a system. The charger is always plugged in in the same place and I charge it every night, overnight." *Age 70*
- The younger participants (under 75) reported using their smartphones to keep in touch with family and friends, research information, play games and do online shopping,

  "I use an iPad to read and send emails and do online shopping. I use internet sites like YouTube to look at songs and song layouts for the guitar." *Age 65*

  "I want to be able to use technology to send emails to people that I don't see so often and keep in touch with them twice a year." *Age 75*
- 30% of participants said that they use a large touchscreen device to register for appointments at the doctor's surgery or the hospital
- 20% of participants said that that they ordered their prescriptions online

  "I do always order my prescriptions over the internet, which works well. You just register to the site and it's all done, really easy and much better than messing about with the surgery." *Age 81*
- Positive attitudes were expressed toward technology that they were already using and in one case (age 81) there was positive enthusiasm; others were more pragmatic.

  "Do you enjoy using touch-screen devices?" "Yes, it keeps me sane." *Age 81*

  "Do you enjoy using touch-screen devices?" "I neither enjoy it or don't enjoy it. I just do it. They are a helpful tool for accessing so much extra knowledge, the knowledge and the access is the enjoyable bit." *Age 65*

PREFERENCE FOR
SIMPLICITY AND FAMILIARITY

- The participants expressed a preference for simplicity, with a slight reluctance toward unfamiliar technology.

  "Simplicity is key." *Age 75*

- One participant used a tablet every day and owned a mobile feature phone which she didn't really use. She said that she didn't really want a mobile phone but it was useful for updating her daughter when she was travelling to visit her.

  "I can't really get on with it. I want an idiot proof phone with no rigmarole, you just press the buttons and speak to someone." *Age 83*

- One participant volunteered that her son can become frustrated with her use of technology saying:

  "You don't even press the buttons to see what happens." *Age 75*

- Some participants perceived that they might not be able to manage a new piece of technology.

  "If I or a colleague wanted to ask you more questions like this would that be OK? "Yes. I would do user testing, but I wouldn't be very good at it and I would feel overly worried about doing the wrong thing and looking stupid." *Age 70*

- 90% of participants gave specific examples of a new technology that they had learned to use.

- One of the oldest participants was positively enthusiastic about new technology.

  "If your doctor were to suggest you use an electronic medical device as part of some treatment you were getting, how do you think that would make you feel? Excited or nervous? "I wouldn't be nervous, I would just get on with it. I love a gadget I do." *Age 81*

LEARNING PREFERENCES AND TRAINING MATERIALS

We asked how participants like to learn and remember new things best: considering video/ TV, written materials, recorded audio materials or speaking to people.

- 60% of the participants preferred video for receiving learning/ training backed up by simple written instructions like a leaflet
- 30% of the participants preferred a leaflet
- 10% preferred a recorded message
- All interviewees talked about their desire to learn being related to having an interest in the topic
- When asked to recall something that they had learnt recently. Most participants recalled an experience or something that had given them a sense of achievement, for example, they had researched something online , had learnt how to do something new or solved a problem.
- In general there was a preference for learning by doing.

"How do you think you learn and remember new things best: from the TV, from speaking to people, from reading about them. . . ?" "From the TV and speaking to people and if I want to know more, I Google it. Specifically, I like to talk to Google "Google, can you tell me. . . ?" Age 81

"I like to have a leaflet. Leaflets are easy to refer back to, I like anything visual but not really audio so much. Of course, it depends on the quality of the writing." Age 65

"When was the last time you had to learn how to use a new piece of electrical or electronic equipment (e.g., washing machine, TV, telephone)? How did you learn how to use it (e.g., read instructions, my daughter helped me)?" "Catch up TV". "My son taught me and asked me questions like, "Can you see the box at the top?" It was quite interactive, I had to do it myself with his guidance." Age 75

AUTHORITY

In order to understand their attitudes and acceptance toward new technology, we asked the participants how they would feel if their doctor asked them to use a new electronic medical device.

- All of the participants expressed reluctant acceptance, but said that they would use a new device if requested to by their doctor.
- 90% of the participants had already been given an electronic medical device to use by their doctor (70% had been given blood pressure monitors and 20% had been given blood glucose meters).
- Only one participant reported any difficulties in using a device provided by their doctor.

"If your doctor were to suggest you use an electronic medical device as part of some treatment you were getting, how do you think that would make you feel? Excited or nervous?"

"Not very good at stuff like that, would probably think, oh, that's a bit of a bother, oh gosh it's another thing to do but if it was all automatic then it might be easier in some ways." *Age 75*

REMOTE APPOINTMENTS

Remote (or virtual) appointments can be achieved via telephone or video calling without the patient having to visit the surgery or clinic in person.

- Most participants had experienced remote doctors appointments and were positive about them.
- Remote appointments were cited as being helpful for:
  - managing ongoing issues
  - obtaining simple prescriptions
  - obtaining advice for someone else being cared for
  - not being reliant on buses or transportation from friends and family
  - not having to go out in bad weather which could be unpleasant or result in a fall or illness.
- Most participants also expressed an opinion that although remote appointments were useful, there were some situations where it would be better to see a doctor in person, for example in new, complex, personal cases or where an examination might be required.

KEY LEARNINGS AND BEST PRACTICES FROM RESULTS

This type of study allows for identification and resolution of issues prior to implementation in a trial, reduces barriers to ePRO, and provides opportunities to engage with patients.

The following five best practices highlight how ePRO can be adapted to suit the older person.

1. SEGMENT BY AGE

Based on the finding that the younger group of the older participants had the same experience and attitude toward technology as the rest of the population, and the older end of the population are more likely to have physical challenges, it might be useful to define older people by several different groups, segmenting by age where possible, similar to paediatric populations. The middle group is hard to define, with the attitudes toward technology being more dependent on mental age, outlook, and willingness to engage.

For instance:

AGE RANGE	DEFINITION
55-74	Younger older people
75-84	Middle-age older people
85 and over	Oldest older people

The WHO website defines age ranges – see website for further details.[7]

2. TRAINING IS KEY

Based on the concern that older people can lack confidence with technology, sponsors and sites should consider the importance of and format of training for older people.

Familiarization with the technology and materials is hugely important to reduce the potential of technology anxiety and/or confidence issues.

Performance anxiety can be mitigated by effective training. In particular, developing a training solution that enables hands-on practice of common activities and enabling these to be performed/ practiced more than once is recommended to ensure that a trial participant will have sufficient confidence and know-how to use the tool at home in an unsupervised setting.

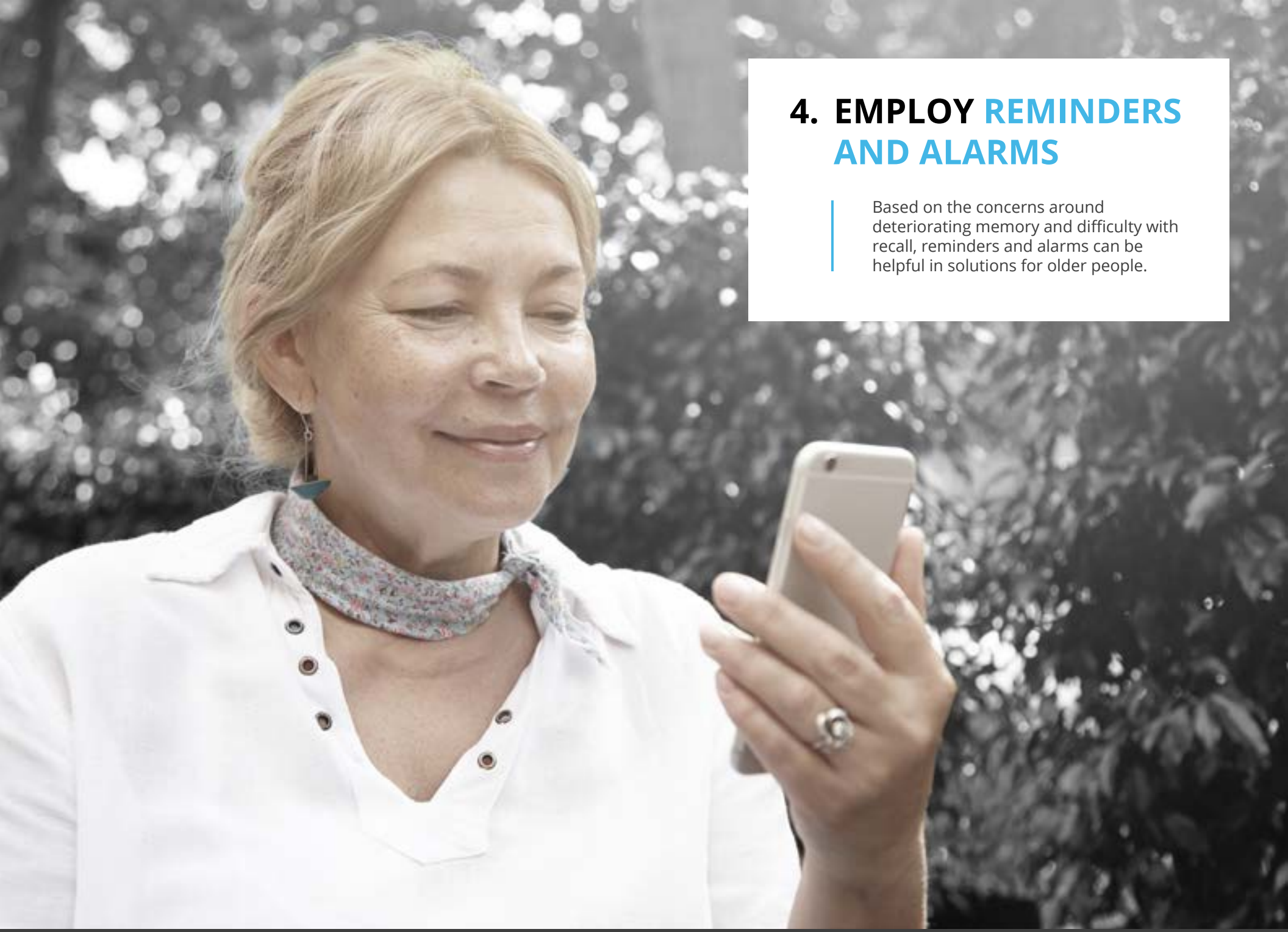
Training should be clearly marked and easy to re-access at any time.

3. UTILIZE TABLETS OR BYOD (BRING YOUR OWN DEVICE)

Based on the finding that 70% of participants were already using tablet devices and were familiar with them, tablets could be considered as the preferred mode of delivery of ePRO for older people. Larger devices with larger screens, and some familiarity (with devices that they are already using for social activities) could help to reduce the performance anxiety sometimes associated with older people and technology.

In addition, sponsors might consider the benefits of 'bring your own device' to run study apps in clinical studies involving older people. The existing acceptance, ability and familiarity with their personal device could be enough to overcome the main perceived barrier to ePRO in this group.

Typically, users will self-select a device that has good usability to meet their individual requirements.[8]

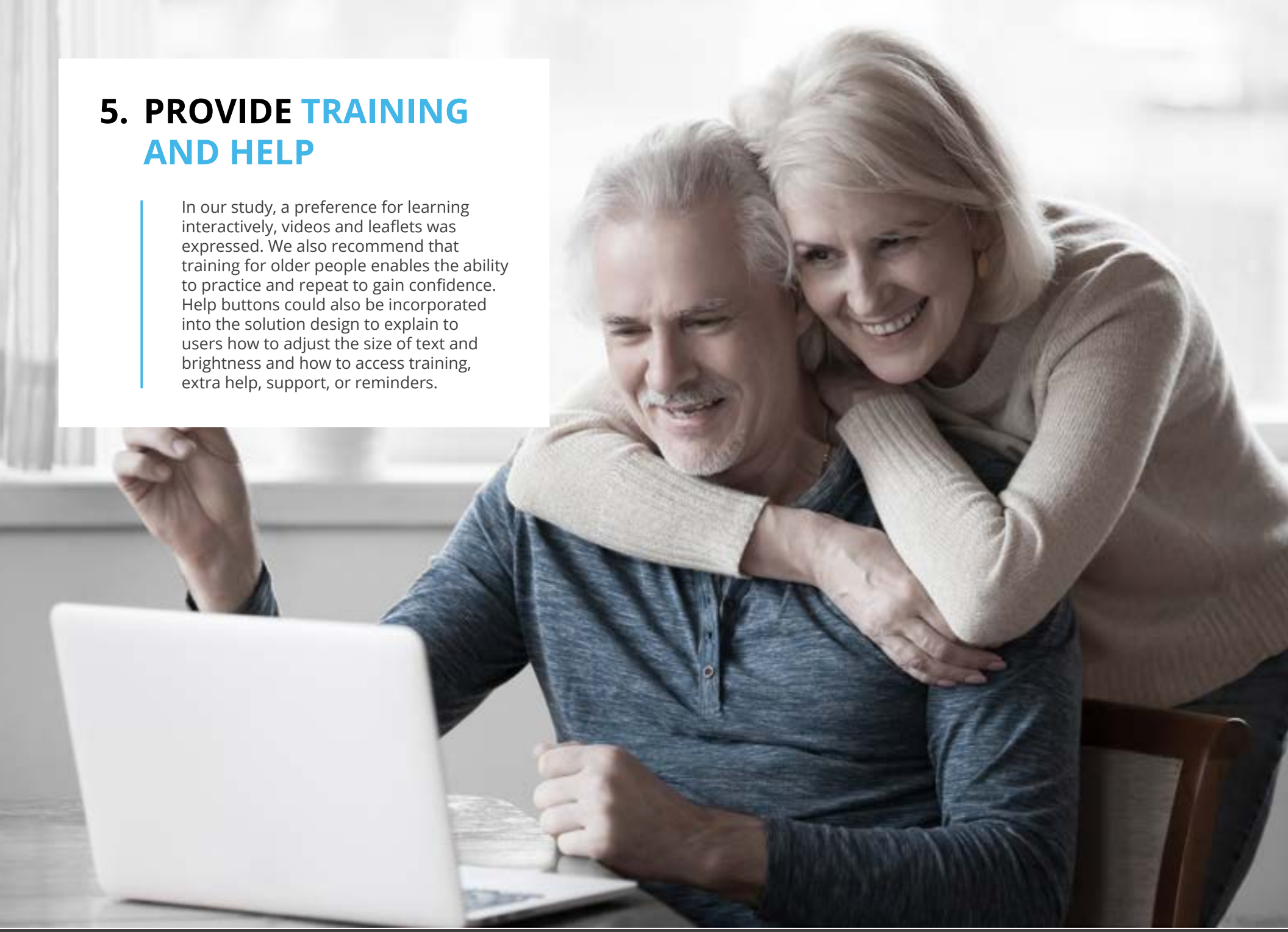


4. EMPLOY REMINDERS AND ALARMS

Based on the concerns around deteriorating memory and difficulty with recall, reminders and alarms can be helpful in solutions for older people.

5. PROVIDE TRAINING AND HELP

In our study, a preference for learning interactively, videos and leaflets was expressed. We also recommend that training for older people enables the ability to practice and repeat to gain confidence. Help buttons could also be incorporated into the solution design to explain to users how to adjust the size of text and brightness and how to access training, extra help, support, or reminders.



SOLUTIONS FOR OLDER USERS OF ePRO

ePRO presents an opportunity to reduce or resolve some of the challenges faced by this population, e.g., difficulty getting to the site. Some of the opportunities presented by mobile technology relate to the built in features that mobile technologies offer e.g. enlarging text, and other opportunities relate to functionality that is available on mobile technology, but the user needs to access the settings or preferences e.g. brightness adjustment. Other opportunities involve simple or more complex design changes.

Table 1. Concerns and solutions for older people using ePRO

CONCERN	SOLUTION
Deteriorating eyesight	Large screens Large answer buttons Adjustable brightness Large or Adjustable font size
Reduced hearing	ePRO material is mostly written and can be re-read at any time. Reduced hearing may affect the ability for older people to hear alarms reminding them to complete ePRO data. Volume settings can be adjusted and a visual message indicator can be associated with alarms.
Difficulties with dexterity	Large screens and answer buttons with large active response areas Ability to accept knuckle tap No need to hold pen or stylus Device can rest on table or lap; it doesn't have to be held ePRO typically has shorter completion times when compared to paper, so can be more manageable for those with poor
Difficulty with recall/memory	Instructions and reminders, no need to remember what to do. Lead the patient through data collection
Reduced mobility / difficulty getting to the site to complete assessments	Collecting more data and performing assessments from home, including ePRO, could lead to less need to attend site visits Avoids difficulties with transportation and bad weather and reduces risk of falls and contracting illness
Lack of ability / confidence / Performance anxiety with technology	Training system to allow hands on practice with the system. Allowing older users more practice to gain familiarity and confidence. Intuitive, well designed training, instructions, screens and screen flow benefit all but especially those that are less familiar with mobile phone technology and software Clear instructions and help options reduce confusion, stress, and anxiety Provisioned devices for subjects who don't already own a device
Low tolerance to fatigue	ePRO is typically associated with shorter completion times when compared to paper
Concomitant medication	eCOA can collect and manage concomitant medication data so that the contribution of these medications can be efficiently documented and acknowledged

COMPLIANCE AMONG OLDER PEOPLE

Adherence to data completion schedules (often referred to as compliance) can be used as a proxy measure of technology acceptability.

An analysis of 196 clinical trials using a smartphone or tablet device to collect ePRO data indicated that older trial participants are among the most compliant with completing ePRO instruments and diaries. Pooled ePRO completion compliance was 84.1% overall but was highest in older populations (88.0%) and carers of infants (93.2%).

AGE GROUP	AVERAGE COMPLIANCE %	NO. SCREENED SUBJECTS
Infant (caregiver)	93.2	7,860
Older people	88.0	9,854
Adult	83.4	73,107
Teenage	79.5	19,342
Pediatric	71.1	2,685

MAKING THE MOVE: EMBRACING ePRO TECHNOLOGY IN OLDER POPULATIONS

Globally, clinical trial sponsors seek to improve processes and generate efficiencies. Technology offers an opportunity to do this and to support the patient's experience. eCOA is now a widely accepted method of data collection in clinical trials and the technology has been shown to reduce administrative burden, automate skip patterns and scoring, avoid secondary data errors, demonstrate data contemporaneousness and reduce missing and invalid data.

Sponsors sometimes raise concerns about using ePRO in older populations. However, ePRO offers many natural, configurable, and design solutions which can benefit the individual subject using the device, the quality of data collected, and the success of the trial. ePRO also provides additional opportunities to engage patients, making it easier for them to complete questionnaires electronically than it would be via pen and paper.

The design of an ePRO solution does not need dramatic adaptation for an older population. Every population needs a screen that is clear and easy to read, a reasonable font size, and a solution that is easy to use.

A typical ePRO solution follows a format that is not challenging:

- Enter a PIN code
- Answer the question
- Hit the Next button
- Answer the question
- Hit the Next button

As the aging population continues to grow, concerns about technology and electronic systems for older people must be addressed, as the benefits greatly outweigh any reasons for reluctance to adopt ePRO in clinical trials. ePRO benefits older people simply due to its more dynamic nature when compared with paper. It also provides opportunities to use technical features, software design and study delivery design to help users, offering a more patient-centric approach.

SUMMARY

- Clinical trial sponsors occasionally raise concerns about using mobile technology in older populations. However, our studies found that these older people were familiar with mobile technology and were already using it successfully in their everyday lives
- The challenge is not the ability of older populations but more related to overcoming potential performance anxiety
- Appropriate training on the device and at the clinical trial sites is critical to overcome uncertainty, anxiety and lack of familiarity with new mobile technology
- Training should be engaging, enable practice on the device and be backed up by a simple, written reference
- Commands, options and explanations should always be clear to avoid any confusion or frustration
- Multimedia offers greater accessibility and flexibility than paper and the navigation and features can be adapted to suit the audience, including larger fonts, screen brightness and colors, tailored information per page, and audio elements
- Having a solution that can be deployed remotely, that is also interactive and presented in a way that allows information to be conveyed over time and not just in text format, is extremely valuable.

FOR FURTHER INFORMATION, PLEASE CONTACT SIGNANT HEALTH AT INFO@SIGNANTHEALTH.COM OR VISIT WWW.SIGNANTHEALTH.COM

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ADDITIONAL RESOURCES

- 'Can Senior's Use Electronic Clinical Outcome Assessments (eCOA)?' Jill Platko. Signant Health video. http://resources.crfhealth.com/solution-videos/can-seniors-use-electronic-clinical-outcome-assessments-ecoa
- 'Can Seniors Use eConsent?' Sam Sather. Signant Health video. http://resources.crfhealth.com/electronic-informed-consent/can-seniors-use-econsent

WHO IS SIGNANT HEALTH?

The best technology succeeds in the background. Signant Health provides solutions that simplify every step of the patient journey to make it easier for people to participate in, and for sites and study teams to run, clinical trials. Signant unites eCOA, eConsent, Patient Engagement, IRT, Clinical Supplies and Endpoint Quality into the industry's most comprehensive patient-centric suite – an evolution built on more than 20 years of proven clinical research technology. Our intense focus on the patient experience, deep therapeutic area expertise and global operational scale enable hundreds of sponsors and CROs (including all Top 20 pharma) to extend the reach of drug development, expand patient opportunities and improve data quality – helping them bring life-changing therapies to our families and communities around the world. Take a significant step toward patient-centricity at signanthealth.com.

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