

# TechSAge Minimum Battery: Overview of Measures

Technical Report TechSAge-TR-1601

Atlanta, GA: Georgia Institute of Technology

Rehabilitation Engineering Research Center on Technologies to Support  
Successful Aging with Disability (RERC TechSAge)

([www.techsage.gatech.edu](http://www.techsage.gatech.edu))

Elena T. Gonzalez

Tracy L. Mitzner

Jon A. Sanford

Wendy A. Rogers

2016



Correspondence concerning this report may be addressed to  
Wendy A. Rogers ([wendyr@illinois.edu](mailto:wendyr@illinois.edu))

**Suggested Citation:** Gonzalez, E. T., Mitzner, T. L., Sanford, J. A., & Rogers, W. A. (2016). *TechSAge minimum battery: Overview of measures* (TechSAge-TR-1601). Atlanta, GA: Georgia Institute of Technology, Rehabilitation Engineering Research Center on Technologies to Support Successful Aging with Disability.

### **Acknowledgements**

This report was supported in part by a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (Department of Health & Human Services, Administration for Community Living) Grant 90RE5016-01-00 under the auspices of the Rehabilitation and Engineering Research Center on Technologies to Support Successful Aging with Disability (TechSAge; [www.techsage.gatech.edu](http://www.techsage.gatech.edu)). The contents of this technical report were developed under a grant from the Department of Health & Human Services, Administration for Community Living. However, those contents do not necessarily represent the policy of the Department of Health & Human Services, Administration for Community Living, and you should not assume endorsement by the Federal Government. The authors would like to thank Sara Bowman and other members of the TechSAge research team for their contributions to the development of the Minimum Battery.

**TABLE OF CONTENTS**

**Executive Summary ..... 4**

**1. Introduction..... 6**

**2. Purpose..... 6**

**3. Development ..... 7**

**4. Administration ..... 8**

**4.1. Paper Version.....8**

**4.2. Online Version ..... 9**

**5. Measures ..... 9**

**5.1. Demographic Information ..... 13**

**5.2. Health Information..... 13**

**5.3. Vision/Hearing/Motor Capabilities..... 15**

        5.3.1. Vision..... 15

        5.3.2. Hearing..... 16

        5.3.3. Motor ..... 16

**5.4. Technology Experience Profile..... 17**

**5.5. Vision ..... 18**

**5.6. Hearing..... 19**

**5.7. Mobility ..... 21**

**5.8. Memory Issues Checklist ..... 22**

**6. Conclusion ..... 23**

**7. References ..... 24**

**Appendix: TechSAge Minimum Battery ..... 27**

## EXECUTIVE SUMMARY

*The mission of the Rehabilitation Engineering Research Center on Technologies to Support Successful Aging with Disability (RERC TechSAge; [www.techsage.gatech.edu](http://www.techsage.gatech.edu)) is to support people with chronic conditions and long-term impairments who are at risk of disability or increased disability due to comorbid age-related losses; by empowering these individuals to sustain independence; maintain health; engage safely in basic activities at home and in the community; fully participate in society; through increasing knowledge about, availability of, and access to effective, universally-designed technologies.*

In large part due to advances in rehabilitation, an unprecedented number of people with impairments acquired in early or middle life are living longer than ever before (Institute of Medicine, 2007). Very little is known about the unique segment of the older adult population with long-term impairments in vision, hearing and mobility. These individuals, often referred to as people “aging with disability”, are likely to experience challenges above and beyond normal aging. The addition of normative age-related changes, such as arthritis or vision loss, on top of pre-existing impairment, can create new or compound challenges in carrying out everyday activities (Harrington, Mitzner, & Rogers, 2015). Although technology holds great potential to support people with impairments as they age, there is need for further research to understand the unique experiences and support needs of this understudied population (Agree, 2014).

The RERC TechSAge is a five-year, multidisciplinary center dedicated to understanding the needs of, and developing supportive technologies for, individuals aging with pre-existing, long-term impairments. TechSAge is comprised of research, development, and training projects made possible by a grant from the National Institute on Disability, Independent Living, and

Rehabilitation Research (Department of Health & Human Services, Administration for Community Living; Grant # 90RE5016-01-00).

One of the goals of TechSAge was to develop an integrated database that could be used to begin to identify technology needs among older adults aging with pre-existing vision, hearing, and mobility impairments. Specific emphasis is placed on capturing and analyzing data from various RERC projects related to: 1) Functional ability (e.g., biomechanical and anthropometric data such as speed, accuracy, efficiency) 2) Personal factors (e.g., demographics, age, education) and 3) Task performance (e.g., task completion, difficulty, independence) within and across activities. As an initial step toward the creation of this database, the TechSAge investigators developed a core battery of background measures to be administered to research participants, referred to as the TechSAge Minimum Battery.

The Minimum Battery is a self-report questionnaire developed to streamline the collection of descriptive information about TechSAge participants. The questionnaire includes measures directly relevant to the TechSAge research questions and target population, such as demographics; health; functional capabilities and limitations; and technology experience. Where possible, efforts were made to include and/or modify existing standardized measures in the literature. The Minimum Battery was designed with flexible options for administration to facilitate data collection across TechSAge studies and large-scale archival analysis. This technical report provides an overview of the TechSAge Minimum Battery with regard to the purpose, development, administration, and the measures that comprise the assessment.

## 1. INTRODUCTION

Adults with impairments are living longer and thus likely to experience age-related declines that can negatively impact their independence and quality of life. Technology holds great potential to support everyday activities and prevent disability among individuals with long-term and even life-long impairments as they age. Researchers in the Rehabilitation Engineering Research Center on Technologies to Support Successful Aging with Disability (RERC TechSAge; [www.techsage.gatech.edu](http://www.techsage.gatech.edu)) are focused on understanding and supporting the unique needs of people aging with pre-existing impairments. Developed as a part of TechSAge, the Minimum Battery is a questionnaire designed to collect a range of background information about research participants across studies. The Minimum Battery is composed of a core set of measures including: demographics; health; sensory and mobility capabilities; technology use; and experience. This provides an overview of the purpose, development, and content of the TechSAge Minimum Battery.

## 2. PURPOSE

In designing technologies and environments to support people aging with disability, it is critical to consider the characteristics of the individual. Individuals aging with long-term, and even life-long, vision, hearing, and mobility impairments are likely to have distinct experiences and challenges as they age. Personal factors, such as health conditions, income, and familiarity with technology, are just a few of the factors that can impact one's ability to successfully carry out daily living activities. In an effort to gather a range of relevant descriptive information about participants, TechSAge investigators developed a core set of background measures called the Minimum Battery.

The Minimum Battery was designed with the intention of streamlining data collection of core measures across TechSAge studies. An important goal for the creation of this standard assessment was the development of a large-scale dataset for cross-study analysis. To achieve this, the Minimum Battery database was established as an archived repository with approval from the Institutional Review Board of the Georgia Institute of Technology. All Minimum Battery data are de-identified and housed in a central repository, through which Principal Investigators submit and request data collected in their studies. The repository was developed to allow for larger archival analyses as data continue to be collected.

### **3. DEVELOPMENT**

The development of the Minimum Battery was an early mission of the center to provide TechSAge investigators, representing a range of disciplines, with a standard assessment to use as a part of their individual research studies. Measures were strategically selected to capture a broad range of participant characteristics pertinent to the target populations and TechSAge research questions. The questionnaire was developed iteratively by members of the TechSAge team and incorporates a number of standard assessments as well as original questions. To minimize the development of new measures, existing assessments were used or modified as much as possible.

Prior to use with TechSAge participants, both the paper and online versions of the Minimum Battery were evaluated by materials testers, including student research assistants, and individuals from each target population (older adults with vision, hearing, and mobility impairments). Through this process, the assessment was refined in terms of formatting and question clarity.

#### **4. ADMINISTRATION**

The Minimum Battery is a self-report (168-item) questionnaire that takes approximately 30-40 minutes to complete. TechSAge investigators are strongly encouraged to administer the Minimum Battery to all participants in their various research and development studies funded by the center. To facilitate this, the Minimum Battery was set up to enable flexible options for administration. Investigators can include the Minimum Battery as an assessment in their study protocol or administer it separately. For separate administration of the Minimum Battery, there is a standalone protocol, consent form, and compensation process; this option was developed to accommodate TechSAge research studies that are unable to add additional materials due to time and/or workload constraints for participants. All investigators are provided with an administration “how to” guide with detailed instructions for collection and storage of Minimum Battery data.

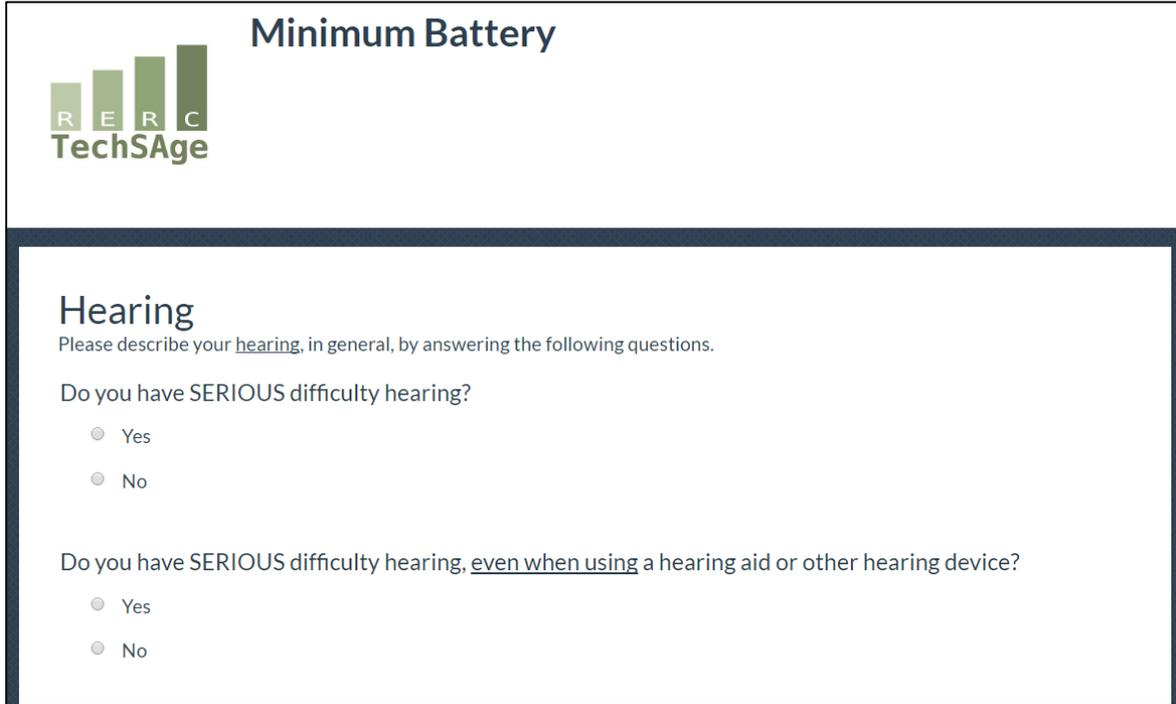
The Minimum Battery is available in two versions: paper or online. Participants have the option to complete the questionnaire on paper or through an online survey managed by the research team. If participants are unable or prefer not to complete the questionnaire themselves, it can be administered to them by a researcher in person or over the phone.

##### **4.1. Paper Version**

See the Appendix for the complete paper version of the Minimum Battery. The questionnaire is in large print (14 point) font to facilitate readability. Participants who opt to complete the paper version of the Minimum Battery are sent the double-sided questionnaire packet in the mail with a self-addressed, pre-paid return envelope. Participants are asked to submit their completed Minimum Battery packet (paper or online version) when they arrive for their scheduled research study appointment.

## 4.2. Online Version

An online version of the Minimum Battery was developed using Survey Gizmo ([www.surveygizmo.com](http://www.surveygizmo.com)) to provide an alternative option for participants to complete the assessment and to facilitate data entry. The online survey can be completed on a computer or tablet and was designed to be screen-reader accessible to accommodate blind/low vision participants. Additionally, research staff can input data collected from paper copies of the Minimum Battery directly into the online survey. Figure 1 displays a screenshot of the hearing capabilities questions from the online version of the Minimum Battery.



The screenshot shows the 'Minimum Battery' survey interface. At the top left is the TechSAge logo, which consists of four green bars of increasing height with the letters R, E, R, C above them, and the text 'TechSAge' below. The title 'Minimum Battery' is in the top right. The main content area is titled 'Hearing' and includes the instruction: 'Please describe your hearing, in general, by answering the following questions.' There are two questions, each with radio button options for 'Yes' and 'No':

Do you have SERIOUS difficulty hearing?

- Yes
- No

Do you have SERIOUS difficulty hearing, even when using a hearing aid or other hearing device?

- Yes
- No

Figure 1. Screenshot of hearing capabilities questions from the online version of the Minimum Battery.

## 5. MEASURES

The Minimum Battery incorporates a number of measures selected to describe a range of characteristics about the participant population, including demographics, health, vision, hearing, mobility, memory capabilities, and technology experience. This section of the report provides an

overview of each section of the Minimum Battery, with regard to source materials, modifications, and original questions. To the extent possible, existing assessments were used and/or modified to form the Minimum Battery. Table 1 displays the source materials for each section of the Minimum Battery. For each assessment, the content in the Minimum Battery (section, page number, and question numbers), the source citation, and the version used (i.e., full, select questions) are provided. Detailed information about how source materials were modified are described in the following sections.

Table 1. *Source Materials Included in the Minimum Battery*

Minimum Battery Section	Page and Question #	Assessment	Source Citation	Version Used
<b>Demographic Information</b>	p. 3-5, (#1-15)	CREATE Demographic and Background Questionnaire	Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006). Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographic and Background Questionnaire (CREATE-2006-02). University of Miami; Florida State University; Georgia Institute of Technology.	Select questions; modified
<b>Health Information</b>	p. 6 (#1-5)	CREATE Demographic and Background Questionnaire	Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006). Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographic and Background Questionnaire (CREATE-2006-02). University of Miami; Florida State University; Georgia Institute of Technology.	Select questions; modified
	p. 7 (#7)	Comorbidities and Age Related Conditions Questionnaire	Tate, D. G., Charlifue, S., Forchheimer, M., Jay, G., Wingo, B. C., Requejo, P. S., Allen, V. E., Campbell, M. L. (2015). Comorbidities and age related conditions among persons with spinal cord injury/disease (SCI/D). <i>Archives of Physical Medicine and Rehabilitation</i> . 96(10): e49.	Select questions; modified
<b>Vision/Hearing/Motor Capabilities</b>	p. 8-13 (#1, 7, 14, 23-25)	U.S. Census Bureau American Community Survey (ACS) Disability Questions	Brault, M. W., U.S. Census Bureau. (2009). Review of Changes to the Measurement of Disability in the 2008 American Community Survey. Retrieved from: <a href="http://www.census.gov/people/disability/files/2008ACS_disability.pdf">http://www.census.gov/people/disability/files/2008ACS_disability.pdf</a>	Full; modified
	p. 8 (#2-5)	U.S. Health and Retirement Study (HRS)	Crews, J. E., Lollar, D. J., Kemper, A. R., Lee, L. M., Owsley, C., Zhang, X.,... Saaddine, J. B. (2012). The variability of vision loss assessment in federally funded sponsored surveys: Seeking conceptual clarity and comparability. <i>American Journal of Ophthalmology</i> , 154, S31-S44.	Select questions; modified
	p. 8-14 (#1, 6, 7, 8, 13, 14, 18, 19, 21, 22)	CATEA Consumer Network Registry Questionnaire	Choi, Y. M., Sabata, D., Todd, R. & Sprigle, S. (2008). Building a consumer network to engage users with disabilities. In P. Langdon, J. Clarkson, & P. Robinson (Eds.), <i>Designing Inclusive Futures</i> (55-62). London: Springer.	Select questions; modified
	p. 9-13 (#6, 13, 21, 22)	National Health Interview Survey (NHIS) on Disability	National Center for Health Statistics (1994) National health interview survey on disability (NHIS-D). Retrieved from: <a href="http://www.cdc.gov/nchs/about/major/nhis_dis/nhis_dis.htm">www.cdc.gov/nchs/about/major/nhis_dis/nhis_dis.htm</a>  Hendershot, G. E., Larson, S., & Lakin, K. C. (2003). An overview of the National Health Interview Survey on Disability. In B. M. Altman, S. N. Barnartt, G. E. Hendershot, S. L. Larson (Eds.), <i>Research in social science and disability, volume 3: Using survey data to study disability: Results from the National Health Interview Survey on Disability</i> (pp. 9- 40). Oxford: Elsevier.	Select questions; modified
<b>Technology Experience Profile</b>	p. 15-18 (#1-36)	Technology Experience Profile (TEP)	Barg-Walkow, L. H., Mitzner, T. L., & Rogers, W. A. (2014). <i>Technology Experience Profile (TEP): Assessment and Scoring Guide</i> (HFA-TR-1402). Atlanta, GA: Georgia Institute of Technology, School of Psychology, Human Factors and Aging Laboratory.	Full; modified

Minimum Battery Section	Page and Question #	Assessment	Source Citation	Version Used
<b>Vision</b>	p. 19-20 (#1-13)	Lighthouse International Functional Vision Screening Questionnaire	Horowitz, A., Teresi, J. E., & Cassels, L.A. (1991). Development of a vision screening questionnaire for older people. <i>Journal of Gerontological Social Work, 17</i> , 37-56.	Select questions; modified
<b>Hearing</b>	p. 21-22 (#1-9)	Speech, Spatial and Qualities of Hearing scale (SSQ12)	Noble, W., Jensen, N. S., Naylor, G., Bhullar, N., Akeroyd, M. A. (2013). A short form of the Speech, Spatial and Qualities of Hearing scale suitable for clinical use: The SSQ12. <i>International Journal of Audiology, 52</i> (6), 409-12.	Select questions; modified
<b>Mobility</b>	p. 23-26 (#1-33)	Late-Life Function and Disability Instrument: Function component	Haley, S. M., Jette, A. M., Coster, W. J., Kooyoomjian, J. T., Levensen, S., Heeren, T., & Ashba, J. (2002). Late-Life Function and Disability Instrument: II. Development and evaluation of the function component. <i>Journal of Gerontology: Medical Sciences, 57A</i> (4): M217–M222.	Full; modified
<b>Memory Issues Checklist</b>	p. 27-31 (#1-25)	Memory Issues Checklist	Prakash, A., Mostafa, A., Mitchell, D.B., & Rogers, W. A. (2014). Understanding older adults' health and social memory needs in the home. Proceedings of the Human Factors and Ergonomics Society 58th Annual Meeting (pp. 155-159). Santa Monica, CA: HFES.  Modified from:  Gilewski, M., Zelinski, E., & Schaie, K. (1990). The Memory Functioning Questionnaire for assessment of memory complaints in adulthood and old age. <i>Psychology and Aging, 4</i> , 482-490.	Select questions; modified

## **5.1. Demographic Information**

The Demographic Information section includes 15 questions about population characteristics (e.g., age, gender, occupational status). Questions include modified items from the demographics portion of the Center for Research and Education on Aging and Technology Enhancement (CREATE) Demographics and Background Questionnaire (Czaja et al., 2006). Certain questions were modified in terms of format and response options, but overall content was not altered. For example, the CREATE question, “Is English your primary language? If no, what is?”, was modified from a yes/no question to a multiple choice question. Anticipating large numbers of deaf participants who use American Sign Language and Spanish, we modified the question to ask, “What is your primary language for communicating?”, with the following response options: English, Spanish, American Sign Language and Other (p. 3; #5).

A few questions were added to assess information specific to TechSAge participants, who are older adults with long-term vision, hearing, and mobility impairments. The developers of the Minimum Battery recognized that some participants may require assistance to complete the questionnaire as a result of their impairment (e.g., blind/low vision, Deaf/ hard of hearing, limited upper body strength or motor control). For this reason, the very first question of the Minimum Battery assesses who is completing the survey on behalf of the participant (p. 3; #1). Additionally, to have a better understanding of available support services, questions were added to assess whether the participant lives in senior housing (p. 4; #11) or receives disability benefits (p. 5; #15).

## **5.2. Health Information**

The Health Information section includes questions about perceived health, medication usage, and health conditions. The first few questions are self-rated health questions from the CREATE

Demographics and Background Questionnaire, which are included verbatim (Czaja et al., 2006). For each question, the respondent rates different aspects of their own health (e.g., general health, satisfaction with health) using a five-point scale that varies by question (p. 6; #1-4).

The Health Information section also features questions about medication usage, which were modified from Czaja et al. (2006). In the CREATE Demographics and Background Questionnaire, respondents are asked several questions about each medication they take including: the reason for taking the medication, dosage, frequency, and duration of use. The developers of the Minimum Battery determined that it was not essential to collect detailed medication information from TechSAge participants, and thus, developed modified questions in which respondents simply write in the number of different prescription medications and over-the-counter medications/supplements they take each day (p. 6; #5-6). These fill-in-the-blank questions assess medication usage at a glance while minimizing the workload of respondents.

Lastly, the Health Information section includes a checklist table of health conditions (p. 7; #7). The 17-item table features modified questions from part one of the Comorbidities and Age Related Conditions Questionnaire, which is a two-part questionnaire developed to assess the presence of health conditions among people aging with spinal cord injury (Tate et al., 2015). Part one of the Comorbidities and Age Related Conditions Questionnaire focuses on chronic conditions and was originally based on the list developed by Medicare to assess chronic and comorbid conditions among beneficiaries, or adults ages 65+ (Centers for Medicare and Medicaid Services, 2012). For each chronic condition question (17 items), respondents are asked, “Have you ever been told by a health professional that you have [insert condition]?”, and if yes, “Did this happen during the last 12 months?” Each of these 17 items are included in the Minimum

Battery in alphabetical order, with response options including yes, no, or do not wish to answer.

There is no follow-up question about whether the diagnosis was in the past year.

### **5.3. Vision/Hearing/Motor Capabilities**

The Vision/Hearing/Motor Capabilities section of the Minimum Battery is divided into three respective parts, each assessing functional capabilities, limitations, and use of supportive aids.

Questions in this section were based on the CATEA Consumer Network (CCN) registry questionnaire, developed by researchers at the Center for Assistive Technology and

Environmental Access (CATEA) at the Georgia Institute of Technology (Choi, Sabata, Todd, & Sprigle, 2008). The CCN is a registry of older adults and people with disabilities who agreed to

participate in research studies, such as technology evaluations and focus groups. The CCN

registry questionnaire was designed to collect descriptive disability data that coincide with that of large-scale surveys and databases. It includes modified questions from the U.S. Census

Bureau's American Community Survey (ACS) Disability Questions and the National Health

Information Survey on Disability (NHIS-D; Brault, 2009; Hendershot, Larson & Lakin, 2003;

National Center for Health Statistics, 1994).

#### **5.3.1. Vision**

The first question in this section is a modified version of the U.S. Census Bureau's ACS disability question on vision, "Do you have serious difficulty seeing, even when wearing glasses

or contact lenses?" (p. 8; #1; Brault, 2009). In the Minimum Battery version, there are two

follow-up questions for respondents who answer yes to assess if the vision difficulty is with one

or both eyes and how old they were when vision difficulty first began. The following questions

were modified from the Health and Retirement Study (HRS) to assess the respondent's visual

ability for near and far distances (Crews et al., 2012). The respondent is asked if they can see

well enough to do different functional tasks, including reading a newspaper and recognizing a friend across the street, with and without wearing glasses or contact lenses (p. 8; #2-5). The vision supportive aids checklist question was modified from the CCN registry questionnaire (p. 9; #6). The question was re-worded to ask about the use of any vision “supportive aids” instead of “equipment for people with vision impairments”. The following response options were added: audio description, reading magnifier, and screen reader.

### **5.3.2. Hearing**

The first question in this section is the hearing disability question from the U.S. Census Bureau’s ACS, “Do you have serious difficulty hearing?” (p. 10; #7; Brault, 2009). The following question, from the CCN Registry Questionnaire, asks about serious difficulty hearing even when wearing a hearing aid or other hearing device (p. 10; #8; Choi et al., 2008). In the Minimum Battery, two follow-up questions were added for respondents who answer “yes” to assess if the hearing difficulty is with one or both ears and how old they were when it first began. The questions thereafter were added to assess whether the respondent is able to do different functional hearing tasks, such as using the phone, with and without a hearing aid. The hearing supportive aids checklist question was modified from the CCN registry questionnaire (p. 11; #13). The question was re-worded to ask about the use of any hearing “supportive aids” instead of “equipment for people with hearing impairments”. Cochlear implant and videophone were added to the list of response options.

### **5.3.3. Motor**

This section includes the remaining ACS Disability questions to assess: ambulatory difficulty (p. 12; #14), self-care difficulty (p. 13; #23), cognitive difficulty (p. 13; #24), and independent living difficulty (p. 14; #25). The following questions were added to gauge more detailed

information about the respondent's ability to walk, with regard to dependence on others and/or mobility aids, and if applicable, at what age the difficulty walking began (p. 12; #15-17). This section also includes modified questions from the CCN registry about difficulty lifting and reaching (p. 12; #18-19). For both questions, respondents who report serious difficulty are prompted to put the age when the difficulty began. An additional question of the same format was added to ask about serious difficulty using hands (p. 13; #20).

The CCN registry checklist question, "Do you NOW use any of the following equipment for people with mobility impairments?" was modified into two questions in the Minimum Battery (p. 13, 21-22). The first question asks the respondent to check all of the lower body supportive aids they use. Additional response options include: grab bars, knee walker, and lift chair. The following question asks the respondent to check all of the upper body supportive aids they use. For both questions, if respondents check an orthotic or prosthetic device, they are asked to specify and write in what they use.

#### **5.4. Technology Experience Profile**

The Technology Experience Profile (TEP) is a questionnaire that assesses familiarity and experience with a range of different technologies (Barg-Walkow, Mitzner, & Rogers, 2014). The TEP features 36 technologies which are categorized into six domains including: communication, computers, everyday technology, health care, recreation, and transportation. For each technology, the respondent is asked to rate how much they have used that particular technology in the past year using a 5-point scale (1 = not sure what it is, 2 = not used, 3 = used once, 4 = used occasionally, 5 = used frequently).

The Minimum Battery includes the full TEP questionnaire with minor modifications. As in the original TEP, the Minimum Battery presents the six technology items in each domain in alphabetical order. However, there is one exception under computer technologies, wherein “tablet computer” was moved directly after “desktop/laptop computer” to make it more obvious that tablets are distinct items from desktop/laptop computers and should be rated separately; this edit was in response to participant feedback during pilot testing of the Minimum Battery. Additionally, to accommodate Deaf/hard of hearing participants, we added the note “\*with or without video relay service” for all audio-based phone technologies (i.e., answering machine/voicemail, automated telephone menu system, mobile phone). Video Relay Service (VRS) is video-based American Sign Language translation service commonly used by Deaf/hard of hearing individuals to communicate with voice telephone users.

### **5.5. Vision**

The Vision section of the Minimum Battery is comprised of modified questions from the Lighthouse International Functional Vision Screening Questionnaire (Horowitz, Teresi, & Cassels, 1991). The Functional Vision Screening Questionnaire is a 15-item, non-diagnostic screening tool used to identify functional indicators of vision problems among older adults. For each question, the respondent answers Yes/No based on whether they experience the vision problem described.

Questions in the Minimum Battery have the same content, but were modified to gauge how difficult each vision-related task is for the respondent to perform (see Figures 2 and 3). Response options were modified from yes/no to a five-point scale to assess level of difficulty (1 = none, 2 = a little, 3 = some, 4 = quite a lot, 5 = cannot do). Additionally, for each item there is

a follow-up Yes/No question to gauge whether or not they use any kind of visual assistive device to perform each activity (e.g., screen reader, reading magnifier).

<b>The Functional Vision Screening Questionnaire</b>	
<p>This is a screening tool to identify older people with a vision problem. People who use glasses or contact lenses should answer the questions in terms of how they see when wearing their glasses or contact lenses. This does not include the use of low vision devices or magnifiers. Read the questions aloud if literacy is a concern.</p>	
<p>1. Do you ever feel that problems with your vision make it difficult for you to do the things you would like to do?</p>	<p>1. Yes      0. No</p>

**Figure 2.** Sample question from the Lighthouse International Functional Vision Screening Questionnaire

<b>How much difficulty do you have...?</b> <i>(Remember, this is without the help of someone else.)</i>	<b>None</b>	<b>A Little</b>	<b>Some</b>	<b>Quite a Lot</b>	<b>Cannot Do</b>	<b>Use Device to Perform Task?</b>	
1. Doing the things you like because of problems with your vision?	1	2	3	4	5	Yes	No

**Figure 3.** Sample of a modified question from the Lighthouse International Functional Vision Screening Questionnaire featured in the Vision section of the Minimum Battery.

Certain questions from the Functional Vision Screening Questionnaire were excluded from the Minimum Battery. The question, “Do you tend to sit very close to the television?” was excluded because the content did not represent a functional vision task. Unlike the other questions, the wording could not be re-phrased to gauge level of difficulty without altering the content. We also excluded the final question, “Has a doctor ever told you that nothing more can be done for your vision?”, which was considered negative and potentially offensive.

### 5.6. Hearing

The Hearing section of Minimum Battery includes 9 of 12 items from the Speech, Spatial and Qualities of Hearing scale (SSQ12) as a measure of hearing abilities and experience (Noble et al., 2013). Questions have the same content, but were modified in terms of the format and

response scale. In the SSQ12, respondents rate their ability to do or experience the situation described in each question by marking a 1-10 scale (1 = not at all, 10 = perfectly). In the Minimum Battery, the question is re-framed into a 2-part question to gauge level of difficulty with each task (without the help of someone else) using a rating scale of 1-5 (1 = none, 2 = a little, 3 = some, 4 = quite a lot, 5 = cannot do). There is also a follow-up, Yes/No question asking whether or not any kind of hearing assistive device (e.g., hearing aid, cochlear implant) is used to perform each task. Sample questions from the SSQ12 and modified SSQ12 questions used in the Minimum Battery can be seen in Figures 4 and 5, respectively.

1. You are talking with one other person and there is a TV on in the same room. Without turning the TV down, can you follow what the person you're talking to says?

*Not at all* | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *Perfectly*

*Not applicable*

**Figure 4.** Sample question from the Speech, Spatial and Qualities of Hearing scale (SSQ12).

<b>How much difficulty do you have...?</b> <i>(Remember, this is without the help of someone else.)</i>	None	A Little	Some	Quite a Lot	Cannot Do	<b>Use Device to Perform Task?</b>	
1. Following what another person is saying when there is a TV on in the same room (without turning the TV down)?	1	2	3	4	5	Yes	No

**Figure 5.** Sample of a modified question from the Speech, Spatial and Qualities of Hearing scale (SSQ12) featured in the Hearing section of the Minimum Battery.

The following questions from the SSQ12 were excluded from the Minimum Battery 9.

“When you hear more than one sound at a time, do you have the impression that it seems like a single jumbled sound?” 11. “Do everyday sounds that you can hear easily seem clear to you (not

blurred)?" 12. "Do you have to concentrate very much when listening to someone or something?" We made every effort to create parallel questions across impairment type, including having a similar number of questions. Thus only the questions deemed most relevant from the SSQ12 were included in the Minimum Battery.

### **5.7. Mobility**

The Mobility section of the Minimum Battery is comprised of modified questions from the function component of the Late-Life Function and Disability Instrument (FDI; Haley et al., 2002). The Late-Life FDI is a two-part assessment used to assess function and disability outcomes among older adults. In the 32-item function component questionnaire, the respondent rates how much difficulty they have doing specific activities on a typical day without the help of someone else and without the aid of an assistive walking device (e.g., cane, walker). People who currently use a walking device are instructed to complete a different set of 8 questions, which ask about difficulty when using their walking device. Respondents are provided with a visual aid of the 5-point difficulty scale, in which each ascending level is in a larger circle and features a description. Figure 6 displays a sample question.

Questions from the Late-Life FDI were modified to ask about the level of difficulty the individual has with each activity when using any kind of assistive device, such as a cane, walker, grab bar, or reacher (See Figure 7). After each difficulty question, respondents are asked a follow up Yes/No question to gauge whether or not they use any kind of assistive device to perform each activity. Thus, the second set of Late-Life FDI function questions for people who use walking devices were excluded. One original question item about difficulty tearing open rigid packaging was added to the Minimum Battery, based on specific research interests among

TechSAge investigators (p. 24; #17). No visual aid for the difficulty scale was included to ensure that participants, including those who are blind/low vision, have equitable experiences.

<p><b>How much difficulty do you have....?</b>                  (Remember this is without the help of someone else and without the use of any assistive walking device.)</p>	None	A little	Some	Quite a lot	Cannot do
F1. Unscrewing the lid off a previously unopened jar without using any devices	5	4	3	2	1

**Figure 6.** Sample question from the Late-Life Function and Disability Instrument (function questions)

<p><b>How much difficulty do you have...?</b>                  (Remember, this is without the help of someone else.)</p>	None	A Little	Some	Quite a Lot	Cannot Do	Use Device to Perform Task?	
1. Unscrewing the lid off a previously unopened jar	1	2	3	4	5	Yes	No

**Figure 7.** Modified questions from Late-Life FDI (function questions) featured in the Mobility section of the Minimum Battery.

### 5.8. Memory Issues Checklist

The Minimum Battery features a modified version of the Memory Issues (Prakash, Mostafa, Mitchell, & Rogers, 2014). Originally adapted from the Memory Functioning Questionnaire by Gilewski, Zelinski, and Schaie (1990), the Memory Issues Checklist was developed to assess frequency and seriousness of forgetting across different categories. The Memory Issues Checklist explores how often an individual forgets different things using a 1-5 scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). The second portion of the checklist, entitled “Seriousness of Forgetting” asks the individual to rate how serious they consider the different types of memory issues to be (1 = not at all, 2 = slightly, 3 = somewhat, 4 = moderately, 5 = extremely).

The modified version of the Memory Issues Checklist in the Minimum Battery includes 25 items which are organized by the following categories: general tasks, health and medication management, household management, leisure activities, and social/interpersonal activities. The

checklist developed by Prakash et al. (2014) asked about memory issues in the home, whereas Minimum Battery version asks about memory issues in general. Seriousness of Forgetting questions were modified in the Minimum Battery so that items represent the categories used in the previous section (e.g., general tasks, health and medication management) in the same order.

## 6. CONCLUSION

RERC TechSAge is dedicated to understanding the needs of, and developing supportive technologies for, individuals aging with pre-existing, long-term impairments. To gather a range of descriptive background and disability-related information from research participants, we developed a core set of measures referred to as the Minimum Battery. The self-report questionnaire provides a standard method of collecting a range of descriptive information about participants including: demographics, health, technology experience as well as functional capabilities with vision, hearing, and mobility. Minimum Battery data continue to be collected from participants across TechSAge studies, which is ultimately contributing to the development of an integrated dataset focused on the understudied population of older adults aging with disability. Outside of TechSAge, the Minimum Battery could serve as a valuable assessment tool for researchers conducting studies with older adults and/or individuals with disabilities.

## 7. REFERENCES

- Agree, E. (2014). The potential for technology to enhance independence for those ageing with a disability. *Disability and Health Journal*, 7, 33-39.
- Barg-Walkow, L. H., Mitzner, T. L., & Rogers, W. A. (2014). *Technology Experience Profile (TEP): Assessment and Scoring Guide* (HFA-TR-1402). Atlanta, GA: Georgia Institute of Technology, School of Psychology, Human Factors and Aging Laboratory.
- Brault, M. W., U.S. Census Bureau. (2009). *Review of changes to the measurement of disability in the 2008 American Community Survey*. Retrieved from [http://www.census.gov/people/disability/files/2008ACS\\_disability.pdf](http://www.census.gov/people/disability/files/2008ACS_disability.pdf)
- Centers for Medicare and Medicaid Services (2012). *Chronic Conditions among Medicare Beneficiaries Chartbook 2012 Edition*. Baltimore, MD.
- Choi, Y. M., Sabata, D., Todd, R., & Sprigle, S. (2008). Building a consumer network to engage users with disabilities. In P. Langdon, J. Clarkson, & P. Robinson (Eds.), *Designing Inclusive Futures* (55-62). London: Springer.
- Crews, J. E., Lollar, D. J., Kemper, A. R., Lee, L. M., Owsley, C., Zhang, X., ... Saaddine, J. B. (2012). The variability of vision loss assessment in federally funded sponsored surveys: Seeking conceptual clarity and comparability. *American Journal of Ophthalmology*, 154, S31-S44.
- Czaja, S. J., Charness, N., Dijkstra, K., Fisk, A. D., Rogers, W. A., & Sharit, J. (2006). *Center for Research and Education on Aging and Technology Enhancement (CREATE)*

*Demographic and Background Questionnaire (CREATE-2006-02)*. University of Miami; Florida State University; Georgia Institute of Technology.

Freedman, V. A. (2014). Research gaps in the demography of aging with disability, *Disability and Health Journal*, 7, S60-S63.

Gilewski, M., Zelinski, E., & Schaie, K. (1990). The Memory Functioning Questionnaire for assessment of memory complaints in adulthood and old age. *Psychology and Aging*, 482-490.

Haley, S. M., Jette, A. M., Coster, W. J., Kooyoomjian, J. T., Levensen, S., Heeren, T., & Ashba, J. (2002). Late-Life Function and Disability Instrument: II. Development and evaluation of the function component. *Journal of Gerontology: Medical Sciences*, 57A(4): M217–M222.

Harrington, C. N., Mitzner, T. L., & Rogers, W. A. (2015). Understanding the role of technology for meeting the support needs of older adults in the USA with functional limitations. *Gerontechnology*, 14, 21-31.

Hendershot, G.E., Larson, S., & Lakin, K.C. (2003). An overview of the National Health Interview Survey on Disability. In B.M. Altman, S.N. Barnartt, G.E. Hendershot, & S.L. Larson (Eds.), *Research in social science and disability, volume 3: Using survey data to study disability: Results from the National Health Interview Survey on Disability* (pp. 9-40). Oxford: Elsevier.

Horowitz, A., Teresi, J. E., & Cassels, L.A. (1991). Development of a vision screening questionnaire for older people. *Journal of Gerontological Social Work*, 17, 37-56.

- Institute of Medicine (2007). *The Future of Disability in America*. Washington, DC: The National Academies Press.
- National Center for Health Statistics (1994). *National health interview survey on disability (NHIS-D)*. Retrieved from [www.cdc.gov/nchs/about/major/nhis\\_dis/nhis\\_dis.htm](http://www.cdc.gov/nchs/about/major/nhis_dis/nhis_dis.htm)
- Noble, W., Jensen, N. S., Naylor, G., Bhullar, N., & Akeroyd, M. A. (2013). A short form of the Speech, Spatial and Qualities of Hearing scale suitable for clinical use: The SSQ12. *International Journal of Audiology*, 52(6), 409-12.
- Prakash, A., Mostafa, A., Mitchell, D.B., & Rogers, W. A. (2014). Understanding older adults' health and social memory needs in the home. *Proceedings of the Human Factors and Ergonomics Society 58th Annual Meeting* (pp. 155-159). Santa Monica, CA: HFES.
- Putnam, M., Molton, I. R., Truitt, A. R., Smith, A. E., & Jensen, M. P. (2016). Measures of aging with disability in U.S. secondary data sets: Results of a scoping review. *Disability and Health Journal*, 9, 5-10.
- Tate, D. G., Charlifue, S., Forchheimer, M., Jay, G., Wingo, B. C., Requejo, P. S., Allen, V. E., Campbell, M. L. (2015). Comorbidities and age related conditions among persons with spinal cord injury/disease (SCI/D). *Archives of Physical Medicine and Rehabilitation*. 96(10): e49.
- Verbrugge, L. M., & Yang, L. (2002). Aging with disability and disability with aging. *Journal of Disability Policy Studies*, 12(4), 253-267.

# RERC TechSage

## Rehabilitation Engineering Research Center on Technologies to Support Successful Aging with Disability

Minimum Battery



For TechSage Personnel Use Only

DATE: \_\_\_ / \_\_\_ / \_\_\_

SUBJECT ID:

\_\_\_ . \_\_\_

Project #

\_\_\_

Study #

\_\_\_\_\_

PID

\_\_\_

Ppt. Initials

Data Entered By:

DATE

1<sup>st</sup> \_\_\_\_\_

\_\_\_ / \_\_\_ / \_\_\_

2<sup>nd</sup> \_\_\_\_\_

\_\_\_ / \_\_\_ / \_\_\_

**This questionnaire asks you to provide information about various aspects of yourself, including your abilities and limitations.**

**These questions were designed to cover a broad range of individuals with different types of abilities and limitations. Please answer these questions in terms of your general abilities and limitations in your daily life.**

**We realize that some of these questions may be sensitive in nature. If there is a question that does not apply to you or that you do not wish to answer, please leave it blank and go on to the next question.**

## Demographic Information

1. Who are you completing this survey for?

I am...

- <sub>1</sub> Entering the responses for myself
- <sub>2</sub> Entering the responses for someone else with their answers
- <sub>3</sub> Entering the responses for someone else based on my experience with them

2. Gender:        <sub>1</sub> Male    <sub>2</sub> Female

3. What is your date of birth? \_\_\_\_\_ (mm/dd/yyyy)

4. Are you fluent in English?        <sub>1</sub> Yes    <sub>2</sub> No

5. What is your preferred language for communicating?

- <sub>1</sub> English
- <sub>2</sub> Spanish
- <sub>3</sub> American Sign Language
- <sub>4</sub> Other (please list)\_\_\_\_\_

6. What is your highest level of education?

- <sub>1</sub> No formal education
- <sub>2</sub> Less than high school graduate
- <sub>3</sub> High school graduate/GED
- <sub>4</sub> Vocational training
- <sub>5</sub> Some or in-progress college/Associate's degree
- <sub>6</sub> Bachelor's degree (BA, BS)
- <sub>7</sub> Master's degree (or other post-graduate training)
- <sub>8</sub> Doctoral degree (PhD, MD, EdD, DDS, JD, etc.)
- <sub>9</sub> Do not wish to answer

7. Current marital status (Check **one**)

- <sub>1</sub> Single
- <sub>2</sub> Married
- <sub>3</sub> Separated
- <sub>4</sub> Divorced
- <sub>5</sub> Widowed
- <sub>6</sub> Other (please specify) \_\_\_\_\_
- <sub>7</sub> Do not wish to answer

8. Do you consider yourself Hispanic or Latino?

- <sub>1</sub> Yes                      <sub>2</sub> No                      <sub>3</sub> Do not wish to answer

9. How would you describe your primary racial group?

- <sub>1</sub> American Indian/Alaska Native  
<sub>2</sub> Asian  
<sub>3</sub> Native Hawaiian or Other Pacific Islander  
<sub>4</sub> Black or African American  
<sub>5</sub> White  
<sub>6</sub> More than one race  
<sub>7</sub> Other (please specify) \_\_\_\_\_  
<sub>8</sub> Do not wish to answer

10. In which type of housing do you live?

- <sub>1</sub> Single family home  
<sub>2</sub> Apartment or Condominium  
<sub>3</sub> Assisted living residence  
<sub>4</sub> Nursing home residence  
<sub>5</sub> Other (please specify) \_\_\_\_\_  
<sub>6</sub> Do not wish to answer

11. Is your housing or community specifically designed for seniors (i.e., 55 and older)?

- <sub>1</sub> Yes                      <sub>2</sub> No                      <sub>3</sub> Not sure

12. What is your primary mode of transportation? (Check **one**)

- <sub>1</sub> Drive myself  
<sub>2</sub> A friend or family member drives me  
<sub>3</sub> Walk  
<sub>4</sub> Bicycle  
<sub>5</sub> Taxi  
<sub>6</sub> Use transportation service provided by my residence  
<sub>7</sub> Use public transportation (e.g., bus, subway, van services)  
<sub>8</sub> Other (please specify) \_\_\_\_\_

13. Which category best describes your yearly household income? Do not give the dollar amount, just check the category.

- <sub>1</sub> Less than \$25,000  
<sub>2</sub> \$25,000 - \$49,999

- 3 \$50,000 - \$74,999
- 4 \$75,000 or more
- 5 Do not wish to answer
- 6 Do not know for certain

**Occupational Status**

14. What is your primary occupational status? (Check **one**)

- 1 Employed full-time      Occupation? \_\_\_\_\_
- 2 Employed part-time      Occupation? \_\_\_\_\_
- 3 Student
- 4 Homemaker
- 5 Retired      Former occupation? \_\_\_\_\_      Year retired? \_\_\_\_\_
- 6 On maternity leave, on sick leave, or disabled
- 7 Unemployed or temporarily laid off
- 8 Other (please specify) \_\_\_\_\_

15. Are you currently receiving disability benefits (e.g., SSI, SSDI)?

- 1 Yes
- 2 No

## Health Information

1. In general, would you say your health is:

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> |
| Poor                                  | Fair                                  | Good                                  | Very good                             | Excellent                             |

2. Compared to other people your own age, would you say your health is:

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> |
| Poor                                  | Fair                                  | Good                                  | Very good                             | Excellent                             |

3. How satisfied are you with your present health?

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> |
| Not at all<br>satisfied               | Not very<br>satisfied                 | Neither satisfied<br>nor dissatisfied | Somewhat<br>satisfied                 | Extremely<br>satisfied                |

4. How often do health problems stand in the way of your doing the things you want to do?

- |                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> <sub>1</sub> | <input type="checkbox"/> <sub>2</sub> | <input type="checkbox"/> <sub>3</sub> | <input type="checkbox"/> <sub>4</sub> | <input type="checkbox"/> <sub>5</sub> |
| Never                                 | Seldom                                | Sometimes                             | Often                                 | Always                                |

5. How many different **prescription medications** do you take each day?

\_\_\_\_\_

6. How many different **over-the-counter medications/supplements** do you take each day?

\_\_\_\_\_

7. Please indicate if you have ever been told by a health professional that you have any of the following conditions. Check **one** box for each condition.

<b>Condition</b>	<b>Yes<sub>1</sub></b>	<b>No<sub>2</sub></b>	<b>Do not wish to answer/ Not sure<sub>3</sub></b>
a. Alzheimer's Disease			
b. Arthritis			
c. Asthma			
d. Cancer			
e. Cardiac Atrial Fibrillation/ Cardiac Arrhythmia			
f. Chronic Kidney Disease			
g. Chronic Obstructive Pulmonary Disease (COPD)			
h. Coronary Artery Disease/ Coronary Heart Disease			
i. Depression			
j. Diabetes/High Blood Sugar			
k. Heart Failure/ Congestive Heart Failure			
l. High Blood Pressure/Hypertension			
m. High Cholesterol/Hyperlipidemia			
n. Osteoporosis			
o. Overweight			
p. Stroke/Transient Ischemic Attack			
q. Other? (If yes, please list below)  _____			

## **Vision/Hearing/Motor Capabilities**

**Please describe your vision, in general, by answering the following questions.**

1. a. Do you have SERIOUS difficulty seeing, even when wearing glasses or contact lenses?

<sub>1</sub> Yes      <sub>2</sub> No

b. If Yes, with one eye or both eyes?

<sub>1</sub> One eye    <sub>2</sub> Both eyes

c. If Yes, how old were you when you first had SERIOUS difficulty seeing (best guess)? \_\_\_\_\_

2. a. Do you wear glasses or contacts to help you see things at a distance?

<sub>1</sub> Yes      <sub>2</sub> No

b. If Yes, can you see well enough to recognize someone across the street when wearing glasses or contact lenses?

<sub>1</sub> Yes      <sub>2</sub> No      <sub>3</sub> Not applicable

3. Can you see well enough to recognize someone across the street without wearing glasses or contact lenses?

<sub>1</sub> Yes      <sub>2</sub> No

4. a. Do you wear glasses or contacts to help you see things close up?

<sub>1</sub> Yes      <sub>2</sub> No

b. If Yes, can you see well enough to read newspaper print when wearing glasses or contact lenses?

<sub>1</sub> Yes      <sub>2</sub> No      <sub>3</sub> Not applicable

5. Can you see well enough to read newspaper print without wearing glasses or contact lenses?

<sub>1</sub> Yes      <sub>2</sub> No

6. Do you NOW use any of the following supportive aids? (Check **all** that apply)

- <sub>1</sub> Audio description
  - <sub>2</sub> Braille
  - <sub>3</sub> Computer equipment (scanners, OCR, etc.)
  - <sub>4</sub> GPS wayfinding device
  - <sub>5</sub> Guide dog
  - <sub>6</sub> Reader service
  - <sub>7</sub> Reading magnifier
  - <sub>8</sub> Screen reader
  - <sub>9</sub> Telescopic lenses
  - <sub>10</sub> White cane
  - <sub>11</sub> Other, please specify: \_\_\_\_\_
  - <sub>12</sub> Do not use any
-

**Please describe your hearing, in general, by answering the following questions.**

7. Do you have SERIOUS difficulty hearing?

- <sub>1</sub> Yes                      <sub>2</sub> No

8. a. Do you have SERIOUS difficulty hearing, even when using a hearing aid or other hearing device?

- <sub>1</sub> Yes                      <sub>2</sub> No

b. If Yes, in one ear or both ears?

- <sub>1</sub> One ear      <sub>2</sub> Both ears

c. If Yes, how old were you when you first had SERIOUS difficulty hearing (best guess)? \_\_\_\_\_

9. a. In the last month, have you used a hearing aid or other hearing device?

- <sub>1</sub> Yes                      <sub>2</sub> No

b. If Yes, can you hear well enough to use the telephone when using a hearing aid?

- <sub>1</sub> Yes                      <sub>2</sub> No                      <sub>3</sub> Not applicable

c. If Yes, can you hear well enough to carry on a spoken conversation in a quiet room when using a hearing aid?

- <sub>1</sub> Yes                      <sub>2</sub> No                      <sub>3</sub> Not applicable

10. Can you hear well enough to use the telephone, without wearing a hearing aid?

- <sub>1</sub> Yes                      <sub>2</sub> No

11. Can you hear well enough to carry on a spoken conversation in a quiet room, without wearing a hearing aid?

- <sub>1</sub> Yes                      <sub>2</sub> No

12. Do you know sign language?

- <sub>1</sub> Not at all  
<sub>2</sub> A little bit  
<sub>3</sub> Fluently

13. Do you NOW use any of the following supportive aids? (Check **all** that apply)

- <sub>1</sub> Assistive listening devices (e.g., personal headphones)
  - <sub>2</sub> Assistive signaling devices (e.g., doorbell flashing light)
  - <sub>3</sub> Closed caption television
  - <sub>4</sub> Cochlear implant
  - <sub>5</sub> Hearing aid
  - <sub>6</sub> Interpreter services (e.g., sign language)
  - <sub>7</sub> TDD, TTY, or Teletype
  - <sub>8</sub> Telephone amplifier
  - <sub>9</sub> Videophone
  - <sub>10</sub> Other, please specify \_\_\_\_\_
  - <sub>11</sub> Do not use any
-

**Please describe your physical mobility and strength, in general, by answering the following questions.**

14. Do you have SERIOUS difficulty walking or climbing stairs?

<sub>1</sub> Yes      <sub>2</sub> No

15. Are you able to walk independently without using a walking aid (e.g., cane, walker, crutches)?

<sub>1</sub> Yes      <sub>2</sub> No

16. a. If you use a walking aid (e.g., cane, walker, crutches), are you able to walk with the walking aid?

<sub>1</sub> Yes      <sub>2</sub> No      <sub>3</sub> Not applicable

b. If Yes, how old were you when you first had difficulty walking (best guess)?

\_\_\_\_\_

17. a. Are you able to walk at all?

<sub>1</sub> Yes      <sub>2</sub> No

b. If No, how old were you when you first had difficulty walking (best guess)?

\_\_\_\_\_

18. a. Do you have SERIOUS difficulty lifting something as heavy as ten pounds, such as a full bag of groceries?

<sub>1</sub> Yes      <sub>2</sub> No

b. If Yes, how old were you when you first had SERIOUS difficulty lifting something as heavy as ten pounds (best guess)? \_\_\_\_\_

19. a. Do you have SERIOUS difficulty reaching over your head?

<sub>1</sub> Yes      <sub>2</sub> No

b. If Yes, how old were you when you first had SERIOUS difficulty reaching over your head (best guess)? \_\_\_\_\_

20. a. Do you have **SERIOUS** difficulty using your hands (e.g., writing, typing, using sign language)?

- <sub>1</sub> Yes      <sub>2</sub> No

b. If Yes, how old were you when you first had **SERIOUS** difficulty using your hands (best guess)? \_\_\_\_\_

21. Do you **NOW** use any of the following lower body supportive aids? (Check **all** that apply)

- <sub>1</sub> Cane  
<sub>2</sub> Crutches  
<sub>3</sub> Power/Electric wheelchair  
<sub>4</sub> Grab bars  
<sub>5</sub> Knee walker  
<sub>6</sub> Lift chair  
<sub>7</sub> Manual wheelchair  
<sub>8</sub> Orthotic device (please specify) \_\_\_\_\_  
<sub>9</sub> Prosthetic device (please specify) \_\_\_\_\_  
<sub>10</sub> Scooter  
<sub>11</sub> Walker  
<sub>12</sub> Other (please specify) \_\_\_\_\_  
<sub>13</sub> Do not use any

22. Do you **NOW** use any of the following upper body supportive aids? (Check **all** that apply)

- <sub>1</sub> Grabber/Reacher  
<sub>2</sub> Orthotic device (please specify) \_\_\_\_\_  
<sub>3</sub> Prosthetic device (please specify) \_\_\_\_\_  
<sub>4</sub> Other (please specify) \_\_\_\_\_  
<sub>5</sub> Do not use any

23. Do you have **SERIOUS** difficulty dressing or bathing?

- <sub>1</sub> Yes      <sub>2</sub> No

24. Because of a physical, mental, or emotional condition, do you have **SERIOUS** difficulty concentrating, remembering, or making decisions?

- <sub>1</sub> Yes      <sub>2</sub> No

25. Because of a physical, mental or emotional condition, do you have difficulty doing errands alone, such as visiting a doctor's office or shopping?

<sub>1</sub> Yes

<sub>2</sub> No

# Technology Experience Profile

The purpose of this set of questions is to assess your familiarity and experience with technology.

The following pages list technologies from different areas.

Please circle the most appropriate response to indicate how much you have used the technology listed, within the last 12 months.

**Within the last 12 months, how much you have used...?**

<b><i>Communication Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
1. Answering Machine/ Voicemail (e.g., record and retrieve messages) *with or without video relay service	1	2	3	4	5
2. Automated Telephone Menu System (e.g., pay bills, refill prescriptions) *with or without video relay service	1	2	3	4	5
3. Fax (e.g., receive and send printed documents)	1	2	3	4	5
4. Mobile Phone (e.g., make and receive calls) *with or without video relay service	1	2	3	4	5
5. Text Messaging (e.g., phone texting, BBM, iMessage, SMS)	1	2	3	4	5
6. Video call/conferencing (e.g., Skype, Facetime)	1	2	3	4	5

**Within the last 12 months, how much you have used...?**

<b><i>Computer Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
7. Desktop/Laptop Computer	1	2	3	4	5
8. Tablet Computer (e.g., iPad, Surface)	1	2	3	4	5
9. Email (e.g., Gmail, Yahoo)	1	2	3	4	5
10. Photo/Video Software (e.g., editing, organizing; iPhoto, Picture Manager, Photoshop)	1	2	3	4	5
11. Productivity Software (e.g., Excel, PowerPoint, Quicken, TurboTax, Word)	1	2	3	4	5
12. Social Networking (e.g., Facebook, MySpace)	1	2	3	4	5

<b>Within the last 12 months, how much you have used...?</b>					
<b><i>Everyday Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
13. Automatic Teller Machine (ATM)	1	2	3	4	5
14. Photocopier (e.g., Lexmark, Xerox)	1	2	3	4	5
15. Home Security System (e.g., Ackerman Security, ADT)	1	2	3	4	5
16. In-Store Kiosk (e.g., grocery self-checkout, price checker)	1	2	3	4	5
17. Microwave Oven	1	2	3	4	5
18. Programmable Device (e.g., coffee maker, thermostat)	1	2	3	4	5
<b>Within the last 12 months, how much you have used...?</b>					
<b><i>Health Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
19. Blood Pressure Monitor (e.g., measure blood pressure)	1	2	3	4	5
20. Digital Thermometer (e.g., measure temperature)	1	2	3	4	5
21. Health Management Software (e.g., to keep track of weight, diet, exercise; Personal Health Record)	1	2	3	4	5
22. Heart Rate Monitor (e.g., measure heart rate, pulse)	1	2	3	4	5
23. Medication Reminder Device (e.g., schedule electronic alerts)	1	2	3	4	5
24. Pedometer (e.g., measure walking distance)	1	2	3	4	5

**Within the last 12 months, how much you have used...?**

<b><i>Recreational Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
25. Digital Music Player (e.g., iPod, MP3 player, Zune, tablet)	1	2	3	4	5
26. Digital Photography (e.g., camera, tablet, phone)	1	2	3	4	5
27. Electronic Book Reader (e.g., Kindle, Nook, tablet)	1	2	3	4	5
28. Gaming Console (e.g., Playstation, Wii, Xbox)	1	2	3	4	5
29. Online Shopping/Coupons (e.g., Amazon, Groupon, retail stores)	1	2	3	4	5
30. Recording and Playback Device (e.g., Blu-Ray, CD, DVD, DVR, VCR)	1	2	3	4	5

**Within the last 12 months, how much you have used...?**

<b><i>Transportation Technology</i></b>	Not sure what it is	Not used	Used once	Used occasionally	Used frequently
31. Airline Kiosk (e.g., check in, print boarding pass)	1	2	3	4	5
32. Bus Tracker (e.g., check location of buses, estimate time of arrival)	1	2	3	4	5
33. Online Map Software (e.g., get directions, plan routes; Google Maps, MapQuest)	1	2	3	4	5
34. In-Vehicle Navigation System/GPS	1	2	3	4	5
35. Online Travel Reservation (e.g., airline website, Expedia, Travelocity)	1	2	3	4	5
36. Parking Payment System (e.g., exiting lot, paying for space)	1	2	3	4	5

## Vision

The following questions ask about your vision in different situations. These questions will ask you to report how difficult you think a task would be for you to do on an average day without the help of someone else. Please answer each question in terms of your best vision, that is how you see when wearing your glasses, contact lenses, or using any kind of assistive device (e.g., screen reader, reader service, GPS wayfinding device, reading magnifier, telescopic lenses).

For each task, you will also be asked if you typically need to use any kind of assistive device to perform the task.

For each question, please indicate 1) how much difficulty you have with each task, and 2) whether you use an assistive device to perform each.

<b>How much difficulty do you have...? (Remember, this is <u>without</u> the help of someone else.)</b>	<b>None</b>	<b>A Little</b>	<b>Some</b>	<b>Quite a Lot</b>	<b>Cannot Do</b>	<b>Use Device to Perform Task?</b>	
1. Doing the things you like because of problems with your vision?	1	2	3	4	5	Yes	No
2. Reading the large print headlines in the newspaper?	1	2	3	4	5	Yes	No
3. Reading the regular print in newspapers, magazines or books?	1	2	3	4	5	Yes	No
4. Reading the numbers and names in a telephone directory?	1	2	3	4	5	Yes	No
5. Seeing the "walk" sign and street name signs when you are walking in the street?	1	2	3	4	5	Yes	No
6. Seeing cars when crossing the street?	1	2	3	4	5	Yes	No

<b>How much difficulty do you have...? (Remember, this is <u>without</u> the help of someone else.)</b>	<b>None</b>	<b>A Little</b>	<b>Some</b>	<b>Quite a Lot</b>	<b>Cannot Do</b>	<b>Use Device to Perform Task?</b>	
7. With your vision in tasks like watching TV, playing cards, sewing?	1	2	3	4	5	Yes	No
8. Reading labels on medicine bottles?	1	2	3	4	5	Yes	No
9. Reading prices when you shop?	1	2	3	4	5	Yes	No
10. Reading your own mail?	1	2	3	4	5	Yes	No
11. Reading your own handwriting?	1	2	3	4	5	Yes	No
12. Recognizing the faces of family or friends when they are across an average size room?	1	2	3	4	5	Yes	No
13. Seeing in dim light?	1	2	3	4	5	Yes	No

## Hearing

The following questions ask about your hearing in different situations. These questions will ask you to report how difficult you think a task would be for you to do on an average day without the help of someone else. Please answer each question in terms of your best hearing, that is how you hear when using any kind of assistive device (e.g., hearing aid, assistive listening device, cochlear implant).

For each task, you will also be asked if you typically need to use any kind of assistive device to perform the task.

For each question, please indicate 1) how much difficulty you have with each task, and 2) whether you use an assistive device to perform each.

<b>How much difficulty do you have...? (Remember, this is <u>without</u> the help of someone else.)</b>	<b>None</b>	<b>A Little</b>	<b>Some</b>	<b>Quite a Lot</b>	<b>Cannot Do</b>	<b>Use Device to Perform Task?</b>	
1. Following what another person is saying when there is a TV on in the same room (without turning the TV down)?	1	2	3	4	5	Yes	No
2. Listening to someone talking to you and trying to follow the news on TV at the same time?	1	2	3	4	5	Yes	No
3. Following what the person you are talking to is saying in a room where there are many other people talking?	1	2	3	4	5	Yes	No
4. Following the conversation in a group of about five people in a busy restaurant where you can see everyone else in the group?	1	2	3	4	5	Yes	No

<b>How much difficulty do you have...? (Remember, this is <u>without</u> the help of someone else.)</b>	<b>None</b>	<b>A Little</b>	<b>Some</b>	<b>Quite a Lot</b>	<b>Cannot Do</b>
5. Following a group conversation that switches from one person to another without missing the start of what each new speaker is saying?	1	2	3	4	5
6. Knowing where a dog is from its bark without having to look at it?	1	2	3	4	5
7. Knowing how far away a bus or a truck is from the sound?	1	2	3	4	5
8. Knowing whether a bus or truck is coming towards you or going away from the sound?	1	2	3	4	5
9. Making out which instruments are playing if you listen to music?	1	2	3	4	5

<b>Use Device to Perform Task?</b>	
Yes	No

## Mobility

The following questions ask about your mobility and strength in different situations. These questions will ask you to report how difficult you think a task would be for you to do on an average day without the help of someone else. Please answer each question in terms of your best mobility and strength, that is how you do these tasks when using any kind of assistive device (e.g., cane, walker, wheelchair, grab bars, scooter, prosthesis, knee walker, grabber, reacher, zipper pull, rubber jar gripper).

For each task, you will also be asked if you typically need to use any kind of assistive device to perform the task.

For each question, please indicate 1) how much difficulty you have with each task, and 2) whether you use an assistive device to perform each.

<b>How much difficulty do you have...?</b> <i>(Remember, this is without the help of someone else.)</i>	<b>None</b>	<b>A Little</b>	<b>Some</b>	<b>Quite a Lot</b>	<b>Cannot Do</b>	<b>Use Device to Perform Task?</b>	
1. Unscrewing the lid off a previously unopened jar	1	2	3	4	5	Yes	No
2. Going up & down a flight of stairs inside, using a handrail	1	2	3	4	5	Yes	No
3. Putting on and taking off long pants (including managing fasteners)	1	2	3	4	5	Yes	No
4. Running 1/2 mile or more	1	2	3	4	5	Yes	No
5. Using common utensils for preparing meals (e.g., can opener, potato peeler, or sharp knife)	1	2	3	4	5	Yes	No
6. Holding a full glass of water in one hand	1	2	3	4	5	Yes	No

<b>How much difficulty do you have...?</b> <i>(Remember, this is without the help of someone else.)</i>	<b>None</b>	<b>A Little</b>	<b>Some</b>	<b>Quite a Lot</b>	<b>Cannot Do</b>	<b>Use Device to Perform Task?</b>	
7. Walking a mile, taking rests as necessary	1	2	3	4	5	Yes	No
8. Going up & down a flight of stairs outside, without using a handrail	1	2	3	4	5	Yes	No
9. Running a short distance, such as to catch a bus	1	2	3	4	5	Yes	No
10. Reaching overhead while standing, as if to pull a light cord	1	2	3	4	5	Yes	No
11. Sitting down in and standing up from a low, soft couch	1	2	3	4	5	Yes	No
12. Putting on and taking off a coat or jacket	1	2	3	4	5	Yes	No
13. Reaching behind your back as if to put a belt through a belt loop	1	2	3	4	5	Yes	No
14. Stepping up and down from a curb	1	2	3	4	5	Yes	No
15. Opening a heavy, outside door	1	2	3	4	5	Yes	No
16. Ripping open a package of snack food (e.g. cellophane wrapping on crackers) using only your hands	1	2	3	4	5	Yes	No
17. Tearing open rigid plastic packaging	1	2	3	4	5	Yes	No

<b>How much difficulty do you have...?</b> <i>(Remember, this is without the help of someone else.)</i>	None	A Little	Some	Quite a Lot	Cannot Do	Use Device to Perform Task?	
18. Pouring from a large pitcher	1	2	3	4	5	Yes	No
19. Getting into and out of a car/taxi (sedan)	1	2	3	4	5	Yes	No
20. Hiking a couple of miles on uneven surfaces, including hills	1	2	3	4	5	Yes	No
21. Going up and down 3 flights of stairs inside, using a handrail	1	2	3	4	5	Yes	No
22. Picking up a kitchen chair and moving it, in order to clean	1	2	3	4	5	Yes	No
23. Using a step stool to reach into a high cabinet	1	2	3	4	5	Yes	No
24. Making a bed, including spreading and tucking in bed sheets	1	2	3	4	5	Yes	No
25. Carrying something in both arms while climbing a flight of stairs (e.g. laundry basket)	1	2	3	4	5	Yes	No
26. Bending over from a standing position to pick up a piece of clothing from the floor	1	2	3	4	5	Yes	No
27. Walking around one floor of your home, taking into consideration thresholds, doors, furniture, and a variety of floor coverings	1	2	3	4	5	Yes	No

<b>How much difficulty do you have...?</b> <i>(Remember, this is without the help of someone else.)</i>	None	A Little	Some	Quite a Lot	Cannot Do	Use Device to Perform Task?	
28. Getting up from the floor (as if you were laying on the ground)	1	2	3	4	5	Yes	No
29. Washing dishes, pots, and utensils by hand while standing at sink	1	2	3	4	5	Yes	No
30. Walking several blocks	1	2	3	4	5	Yes	No
31. Taking a 1 mile, brisk walk without stopping to rest	1	2	3	4	5	Yes	No
32. Stepping on and off a bus	1	2	3	4	5	Yes	No
33. Walking on a slippery surface outdoors	1	2	3	4	5	Yes	No

## Memory Issues Checklist

We are interested in learning about memory issues that you experience. In particular, we want to understand how often you forget different things (objects, activities, events, etc.). In addition, we want to learn how serious you consider these memory issues to be.

When completing this questionnaire, please think about your current everyday life.

For each item, please circle the most appropriate response. There are no right or wrong answers.

N/A stands for Not Applicable.

## General Tasks

I forget...	Never	Rarely	Some times	Often	Always	
1. appointments (e.g., healthcare-related, work-related)	1	2	3	4	5	N/A
2. names of things and places (e.g., brands, restaurants)	1	2	3	4	5	N/A
3. the right word to use in a context	1	2	3	4	5	N/A
4. to take something with me (e.g., plate, towel, umbrella)	1	2	3	4	5	N/A
5. where I left something (e.g., keys, TV remote, mobile phone)	1	2	3	4	5	N/A

## Health and Medication Management

I forget...	Never	Rarely	Some times	Often	Always	
6. to take my medication(s)	1	2	3	4	5	N/A
7. specific instructions about a medication (e.g., dosage, side effects, what to take it with)	1	2	3	4	5	N/A
8. to drink water	1	2	3	4	5	N/A
9. to eat a meal	1	2	3	4	5	N/A

I forget...	Never	Rarely	Some times	Often	Always	
10. to use my health monitoring device (e.g., blood glucose meter, blood pressure monitor)	1	2	3	4	5	N/A

## Household Management

I forget...	Never	Rarely	Some times	Often	Always	
11. to do housekeeping tasks (e.g., cleaning dishes, taking out trash)	1	2	3	4	5	N/A
12. to pay bills	1	2	3	4	5	N/A
13. to pay taxes	1	2	3	4	5	N/A
14. how to prepare a meal	1	2	3	4	5	N/A
15. to schedule maintenance or repair tasks (e.g., roof repair, pest control)	1	2	3	4	5	N/A

## Leisure Activities

I forget...	Never	Rarely	Some times	Often	Always	
16. to exercise	1	2	3	4	5	N/A
17. correct exercise procedures	1	2	3	4	5	N/A
18. details from TV shows or movies I have watched	1	2	3	4	5	N/A

I forget...	Never	Rarely	Some times	Often	Always	
19. details about what I have read (e.g., in a book, magazine, newspaper, or online)	1	2	3	4	5	N/A
20. details of my favorite songs and poems (e.g., lyrics, lines)	1	2	3	4	5	N/A

### **Social/Interpersonal Activities**

I forget...	Never	Rarely	Some times	Often	Always	
21. names of people	1	2	3	4	5	N/A
22. faces of people	1	2	3	4	5	N/A
23. significant social events (e.g., birthdays, anniversaries)	1	2	3	4	5	N/A
24. details from past conversations (e.g., who, what, when)	1	2	3	4	5	N/A
25. to give a message, return a call, or reply to an email or letter	1	2	3	4	5	N/A

## Seriousness of Forgetting

Listed below are five categories of tasks and activities that require memory use. When you experience a memory failure in the following categories, how much does the problem bother you? In other words, how serious do you consider a memory failure to be if it is related to the following categories that were asked about in the previous section?

For each item, please circle the most appropriate response.

When you actually forget, how <u>serious</u> a problem do you consider the memory failure to be if it is related to...	Not at all serious	Slightly serious	Somewhat serious	Moderately serious	Extremely serious
1. general tasks	1	2	3	4	5
2. health and medication management	1	2	3	4	5
3. household management	1	2	3	4	5
4. leisure activities	1	2	3	4	5
5. social/ interpersonal activities	1	2	3	4	5