

## Supplemental Material S2. Questionnaire in English.

The English translation was performed by the first author (K.K.) whereafter the co-authors (S.D. and H.K.) verified the translated questionnaire on accuracy of writing and content. The main goal of adding this English translation was to improve understanding for readers not familiar with the Dutch language.

### Work setting

*The following seven questions ask about your work setting.*

1. How long have you been a professional audiologist employed in a hearing center?  
  
.....years and .....months
2. In which province is the hearing center in which you are employed located? If you are employed at multiple hearing centers in different provinces, please indicate multiple answers.
  - a. West Flanders
  - b. East Flanders
  - c. Antwerp
  - d. Flemish Brabant
  - e. Limburg
  - f. Brussels Capital Region
3. How do you carry out your profession?
  - a. Self-employed
  - b. Employed
4. Specify the ratio of adults ( $\geq 18$  years) to children ( $< 18$  years) that you treat on an average annual basis. Express this as a percentage (e.g., 80% adults, 20% children). This may be an estimate. Specify this for you personally and not for the entire hearing center.  
  
.....% adults and .....% children
5. Specify how many new adult patients with age-related hearing loss you test on an average annual basis (regardless of whether they were subsequently fitted with hearing aids). New patients do not mean existing patients, but only first-time applicants. This may be an estimate. Please specify this for you personally and not for the entire hearing center.
  - a. Less than 100
  - b. Between 100 and 150
  - c. Between 150 and 200
  - d. Between 200 and 250
  - e. More than 250
6. Indicate in percentages how many of these new adult patients with age-related hearing loss exhibited a particular hearing severity based on their PTA (pure tone average at 1000, 2000,

and 4000 Hz). This may be an estimate. Specify this for you personally and not for the entire hearing center.

- a. Mild hearing loss (21 - 40 dB HL): .....
  - b. Moderate hearing loss (41 - 70 dB HL): .....
  - c. Severe hearing loss (71 - 90 dB HL): .....
  - d. Very severe hearing loss (> 90 dB HL): ..... ..
7. Specify how many of these new adult patients with age-related hearing loss you have fitted with bilateral hearing aids on an average annual basis, leading to the purchase of hearing aids. This may be an estimate. Specify this for you personally and not for the entire hearing center.
- a. Less than 100
  - b. Between 100 and 150
  - c. Between 150 and 200
  - d. Between 200 and 250
  - e. More than 250

## Practical Experience

*The following sixteen questions ask about your practical experience fitting hearing aids within adult patients with age-related hearing loss, in relation to cognition (i.e., mental brain processes that occur during perceiving, information processing, learning, thinking as well as problem solving) and listening effort (i.e., attentional and cognitive effort during speech understanding). The questions below should be answered honestly and truthfully based on your experience with adult patients with age-related hearing loss.*

8. I understand that all of the following questions should be completed for adult patients with age-related hearing loss.
  - a. Yes
9. I question listening effort in everyday situations (i.e., attention and cognitive effort during speech understanding) literally during the anamnesis interview?
  - a. Never
  - b. Sometimes
  - c. Usually
  - d. Always
10. Information regarding listening effort in daily situations is indirectly inferred from the anamnestic interview?
  - a. Never
  - b. Sometimes
  - c. Usually
  - d. Always
11. I literally question the patient's cognitive status during the anamnesis interview?
  - a. Never
  - b. Sometimes
  - c. Usually
  - d. Always
12. Information regarding the patient's cognitive status is indirectly inferred from the anamnestic interview?
  - a. Never
  - b. Sometimes
  - c. Usually
  - d. Always
13. Information regarding the patient's cognitive status is indicated by a patient's significant other.
  - a. Never
  - b. Sometimes
  - c. Usually
  - d. Always

14. Is the patient's cognitive status assessed by means of a (screening) test?
- Yes
  - No
  - If yes, please specify which (screening) test (e.g. MoCA, MMSE, ...): .....
15. I feel able to recognize when the patient is cognitively impaired. 'Cognitively impaired' may be interpreted very broadly, ranging from early symptoms of cognitive decline (e.g. absent-mindedness, forgetfulness, processing information less quickly or accurately, etc.) to dementia. However, it should not be confused with a low intelligence quotient, e.g. people with intellectual disabilities do not belong to the category of 'cognitively impaired'.
- Never
  - Sometimes
  - Usually
  - Always
16. Specify the ratio of the number of patients you know and/or suspect to be cognitively impaired to the number of patients you suspect to have a cognitively normal profile. Express this as a percentage (e.g., 10% cognitively impaired, 90% normal cognitive profile). This may be an estimate.
- 0 - 10% cognitively impaired patients (i.e., 90 - 100% patients with a normal cognitive profile)
  - 11 - 20% cognitively impaired patients (i.e., 80 - 89 % patients with a normal cognitive profile)
  - 21 - 30% cognitively impaired patients (i.e., 70 - 79 % patients with a normal cognitive profile)
  - 31 - 40% cognitively impaired patients (i.e., 60 - 69 % patients with a a normal cognitive profile)
  - 41 - 50% cognitively impaired patients (i.e., 50 - 59 % patients with a normal cognitive profile)
17. If I am fitting a hearing aid to a patient who I know and/or suspect is cognitively impaired, I adjust my general strategy by (multiple answers possible):
- Getting the environment (family, friends, etc.) more involved
  - Scheduling more time for a consultation
  - Providing simpler instructions
  - Speaking more slowly
  - Using more visual support materials (e.g., give more written information)
  - Using more objective tests (e.g., real ear measurements, data logging, etc.)
  - Using other word list when conducting speech audiometry
  - I do not adjust my strategy
  - Other: .....

18. Answer the following statements about the fitting of a hearing aid with yes, no, or I do not know. If yes, specify by giving for example a concrete example.

Statements	Yes	No	I do not know
I fit noise reduction differently with patients who are cognitively impaired compared to cognitively stronger patients. For example: enabling/disabling noise reduction, adjusting strength of noise reduction system, ...			
I fit the microphone directionality differently with patients who are cognitively impaired compared to cognitively stronger patients. For example: enable or disable automatic switching between different microphone settings, ...			
I fit amplitude compression differently with patients who are cognitively impaired compared to cognitively stronger patients. For example: using different compression ratios, adjusting maximal power output, adjusting release times, ...			
I fit frequency compression differently for patients who are cognitively impaired compared to cognitively stronger patients. For example: using different compression ratios, adjusting release times, ...			
I fit the amplification differently with patients who are cognitively impaired compared to cognitively stronger patients. For example: more or less amplification, faster amplification build-up, ...			
I fit the number of manual programs available in the hearing aid differently for patients who are cognitively impaired compared to cognitively stronger patients. For example: setting more or fewer available manual programs, ...			

19. I feel that patients who are cognitively impaired have more subjective hearing aid benefit in general compared to cognitively stronger patients. Subjective refers to their own experiences.

- Yes
- No, subjective less hearing aid benefit
- No difference
- I do not know

20. I feel that patients who are cognitively impaired have more objective hearing aid benefit in general compared to cognitively stronger patients. Objective refers to hearing aid benefit based on standard tests.

- Yes
- No, objective less hearing aid benefit
- No difference

- d. I do not know
21. I feel that patients who are cognitively impaired withdrawal more from audiological rehabilitation programs compared to cognitively stronger patients.
- a. Yes
  - b. No, less withdrawal
  - c. No difference
  - d. I do not know
22. I feel that patients who are cognitively impaired benefit more from a lower technology level compared to cognitively stronger patients.
- a. Yes
  - b. No, more benefit from a higher technology level
  - c. No difference
  - d. I do not know
23. I feel that patients who are cognitively impaired are more motivated compared to cognitively stronger patients.
- a. Yes
  - b. No, less motivated
  - c. No difference
  - d. I do not know

## Knowledge

*The following thirteen questions assess your knowledge (i.e., theoretical basis and not practical experience) about the link between understanding speech, cognition (i.e., mental processes in the brain referred to as occurring when people perceive, process information, learn, think, and solve problems), listening effort (i.e., attention and cognitive effort during understanding speech), and the hearing aid benefit. Please fill these out honestly and truthfully.*

24. How would you rate your knowledge regarding cognition?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
25. How would you rate your knowledge regarding the possible link between cognition and speech understanding?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
26. How would you rate your knowledge regarding the possible link between cognition and age-related hearing loss?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
27. How would you rate your knowledge regarding the possible link between cognition and the hearing aid benefit?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
28. How would you rate your knowledge regarding listening effort?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
29. How would you rate your knowledge regarding the possible link between cognition and listening effort?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
30. How would you rate your knowledge regarding the possible link between listening effort and age-related hearing loss?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
31. How would you rate your knowledge regarding the possible link between listening effort and the hearing aid benefit?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
32. How would you rate your knowledge regarding tests that evaluate cognition?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
33. How would you rate your knowledge regarding tests that evaluate listening effort?
  - a. VAS 0: no to limited knowledge - 100: very good knowledge
34. How did you already receive information regarding cognition? (multiple answers possible)
  - a. Congress
  - b. Webinar

- c. Internal training within the hearing center
  - d. Scientific article
  - e. Educational program of Audiology
  - f. I have not yet received any information regarding cognition
  - g. Other: .....
35. How did you already receive information regarding listening effort? (multiple answers possible)
- a. Congress
  - b. Webinar
  - c. Internal training within the hearing center
  - d. Scientific article
  - e. Educational program of Audiology
  - f. I have not yet received any information regarding listening effort
  - g. Other: .....
36. I would like to receive more information on the link between cognition, listening effort, hearing loss, and the hearing aid advantage through (multiple answers possible)
- a. Information brochure
  - b. Website
  - c. Scientific article
  - d. Webinar
  - e. Congress
  - f. Internal training within the hearing center
  - g. Other: .....
  - h. I do not wish to receive information



## **Willingness and guidelines**

*The following ten questions assess your willingness to implement cognition within audiological practice. In addition, some questions interrogate how this implementation would be feasible for you.*

37. If cognition is found to have a significant link to hearing aid benefit, I would be willing to assess cognition as a standard practice within each patient.
  - a. VAS 0: no willingness - 100: willingness
38. If cognition is found to have a significant link to hearing aid benefit, I am willing to assess cognition only within specific patients (e.g., patients who I suspect and/or know are cognitively impaired).
  - a. VAS 0: no willingness - 100: willingness
39. If cognition is found to have a significant link to hearing aid benefit, a collaboration with other disciplines (e.g., neuropsychology) seems necessary.
  - a. VAS 0: not true - 100: completely true
40. If cognition is found to have a significant link to hearing aid benefit, an (internal) training seems essential before implementing cognition in clinical practice.
  - a. VAS 0: not true - 100: completely true
41. I would feel comfortable discussing cognitive outcomes with the patient.
  - a. VAS 0: not comfortable - 100: very comfortable
42. I suspect that patients will not object to cognitive testing being administered in audiological practice when its usefulness is properly framed.
  - a. VAS: 0 no objection - 100: objection
43. I suspect that the patient's immediate environment will not object to cognitive testing being administered in audiological practice when its usefulness is properly framed.
  - a. VAS 0: no objection - 100: objection
44. I would feel comfortable administering cognition using (multiple answers possible)
  - a. An anamnestic interview
  - b. A questionnaire
  - c. A screening test
  - d. One specific cognitive test
  - e. Two specific cognitive tests
  - f. More than two specific cognitive tests
  - g. Other: .....
45. I would not feel comfortable administering cognition because (multiple answers possible)
  - a. This is not within my area of expertise
  - b. This does not seem possible time wise

- c. I am afraid of getting an unpleasant reaction from patients
- d. This may be an additional factor in discouraging patients from switching to hearing aids
- e. Other: .....

46. Evaluating cognition in audiological practice may have a maximum duration of ..... minutes

## Demographics

The last three questions interrogate some demographic data.

47. Date of birth

48. Gender

- a. Male
- b. Female
- c. X

49. At which educational institution did you obtain your degree in audiology?

- a. Arteveldehogeschool
- b. Hogeschool Gent
- c. VIVES Catholic University College
- d. Thomas More
- e. Catholic University of Leuven
- f. Ghent University
- g. Other: .....