Supplementary Material

eFigure 1: The Lexie app interface for the self-adjustment self-fitting process. The app interface provided a set of intuitive controls conceptualized as 'wheels,' which allowed users to modify key acoustic parameters. These parameters included world volume, i.e., overall gain (or amplification level) and spectral tilt (the balance of bass and treble frequencies).

eFigure 2: The Lexie app interface for the in-situ audiometry self-fitting process. (A) The app prompted the participants to take a hearing test, (B) The app provided instructions to the participants for the in-situ hearing test using their hearing aids, (C) The app facilitated a practice round to ensure that the participants comprehend the instructions, (D) The app initiated the in-situ hearing test, (E) Based on the hearing test results, the app recommended personalized settings.

eFigure 3: (A) Distribution of conventional pure tone audiometric frequencies for the left ear, (B) Distribution of conventional pure tone audiometric frequencies for the right ear, n = 28. Standard deviations are shown as error bars.

eFigure 4: International Outcomes Inventory for Hearing Aids (IOI-HA) items for the in-situ audiometry (IA) self-fitting and self-adjustment (SA) self-fitting measured after approximately four weeks of hearing aid use. *Clinically meaningful advantage ($r \geq 0.3$).

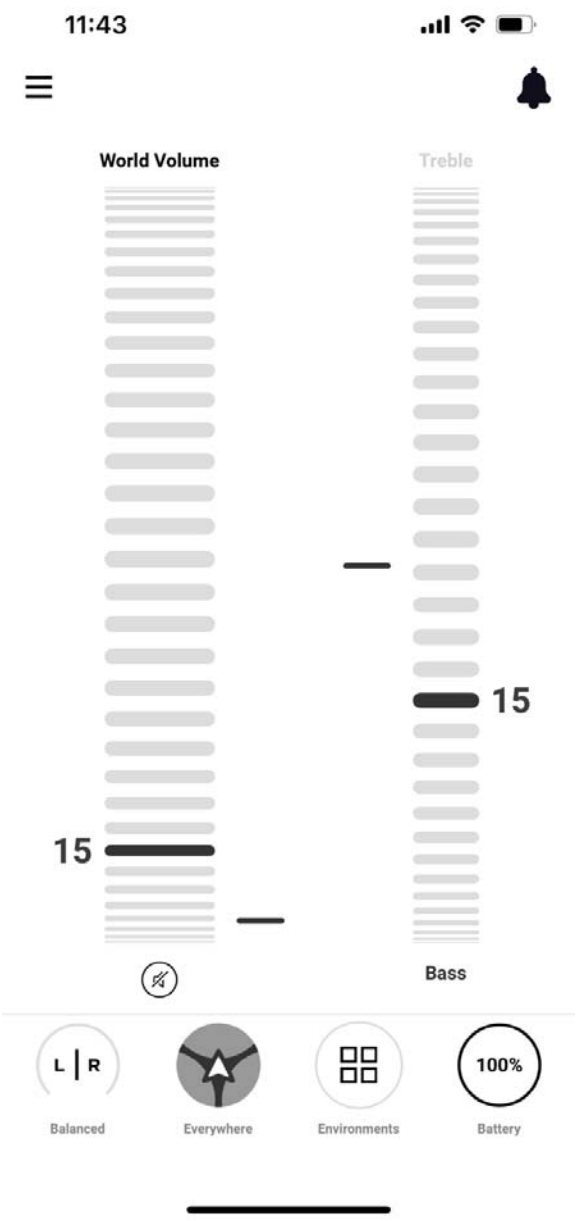
eFigure 5: (A) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy immediately after fitting, (B) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy immediately after fitting, (C) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy after field trial, (D) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy after field trial. The stimulus was a 55 dB SPL International Speech Test Signal.

eFigure 6: (A) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy immediately after fitting, (B) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy immediately after fitting, (C) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy after field trial, (D) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy after field trial. The stimulus was a 75 dB SPL International Speech Test Signal.

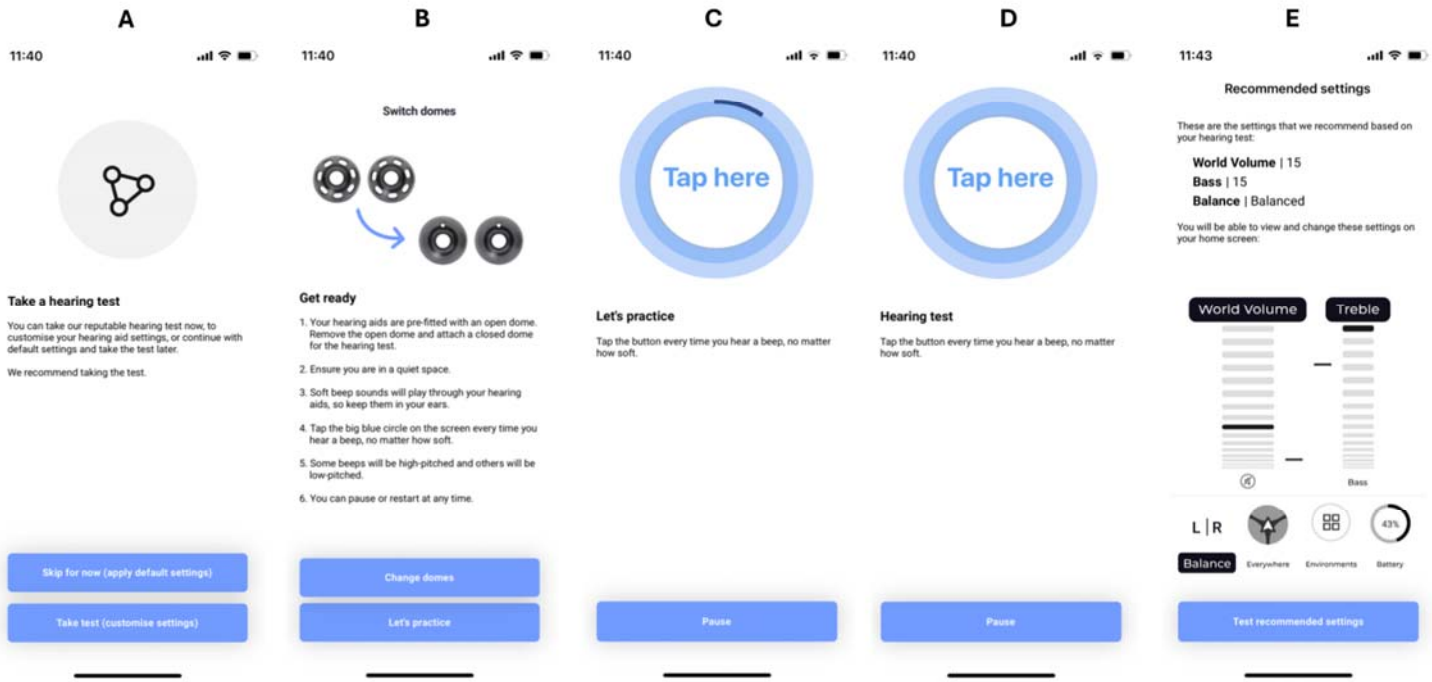
eTable 1: DIN and QuickSIN Benefit Scores for the Self-Adjustment and In-situ Audiometry Self-fitting Strategies After Fitting and After Field Trial (n = 28)

eTable 2: CONSORT checklist of information to include when reporting randomised crossover trials

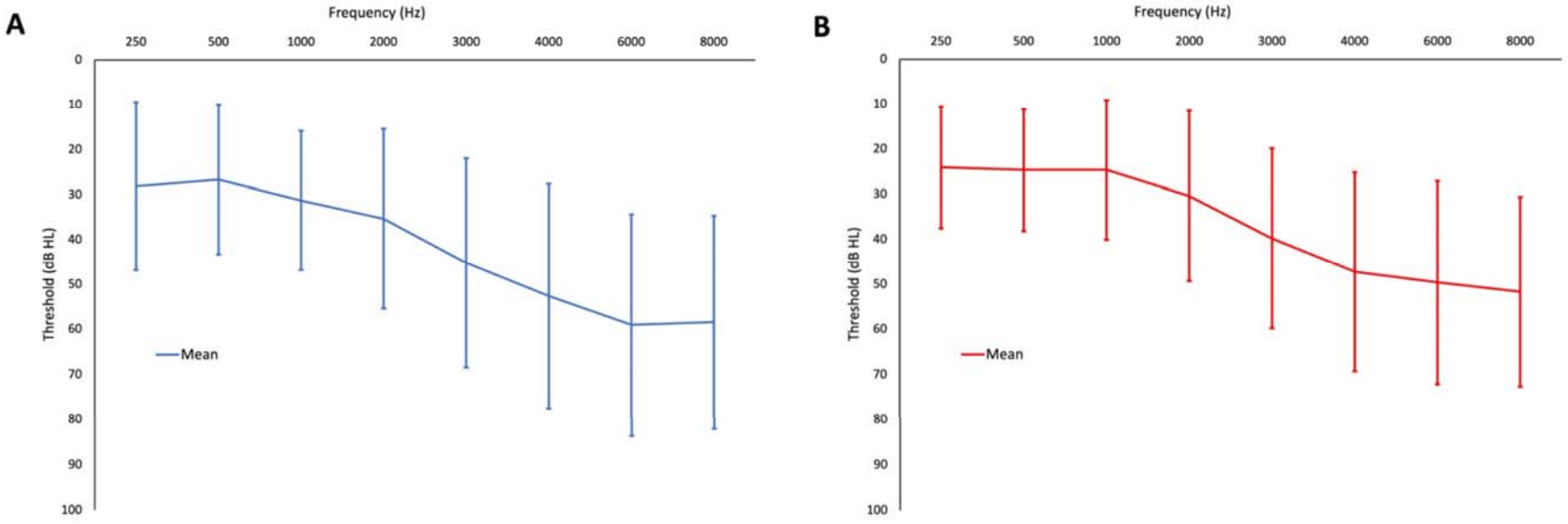
eTable 3: Information to include in abstract of report of randomised crossover trial: extension of CONSORT for abstracts checklist



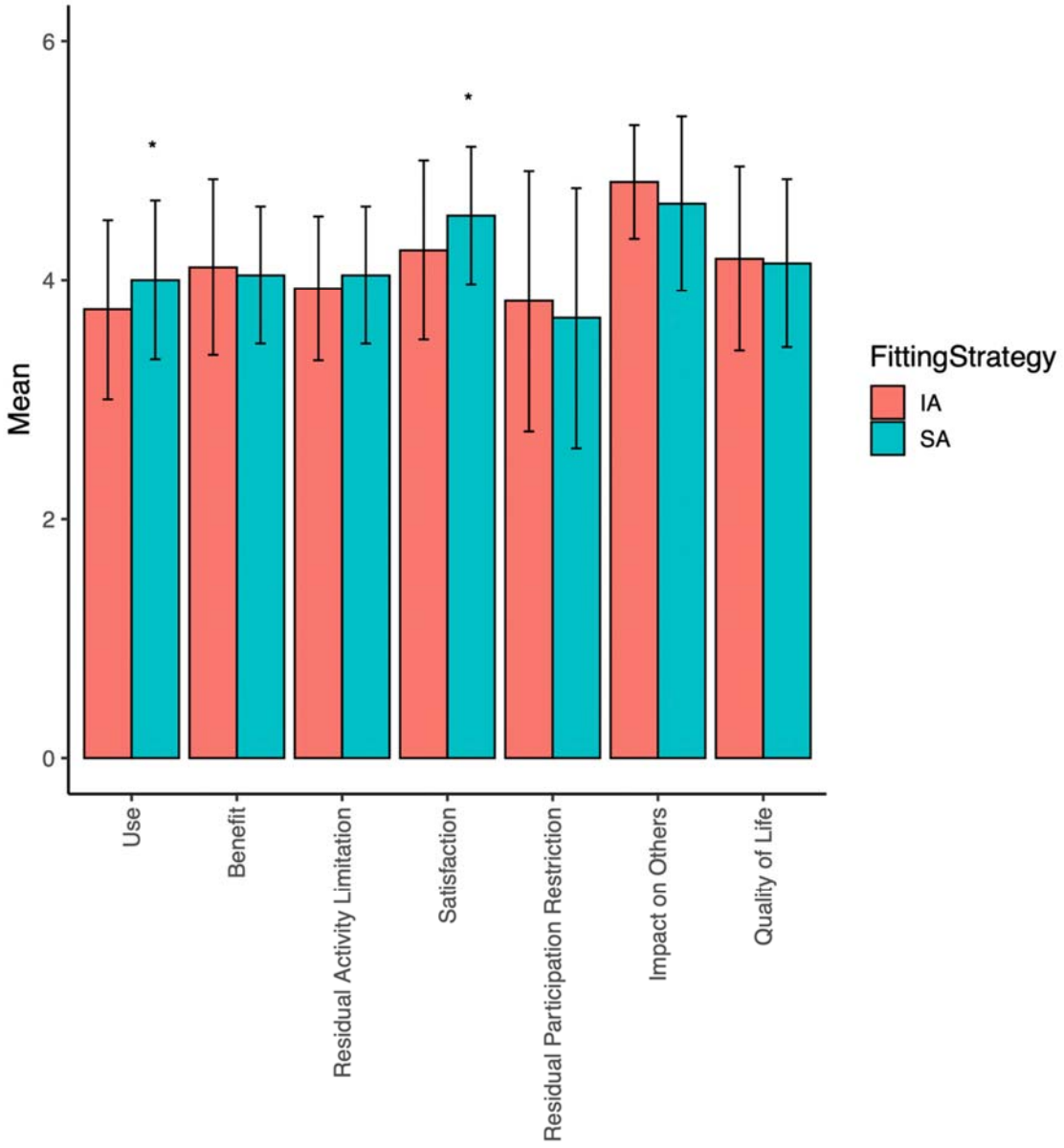
eFigure 1. The Lexie app interface for the self-adjustment self-fitting process. The app interface provided a set of intuitive controls conceptualized as 'wheels,' which allowed users to modify key acoustic parameters. These parameters included world volume, i.e., overall gain (or amplification level) and spectral tilt (the balance of bass and treble frequencies).



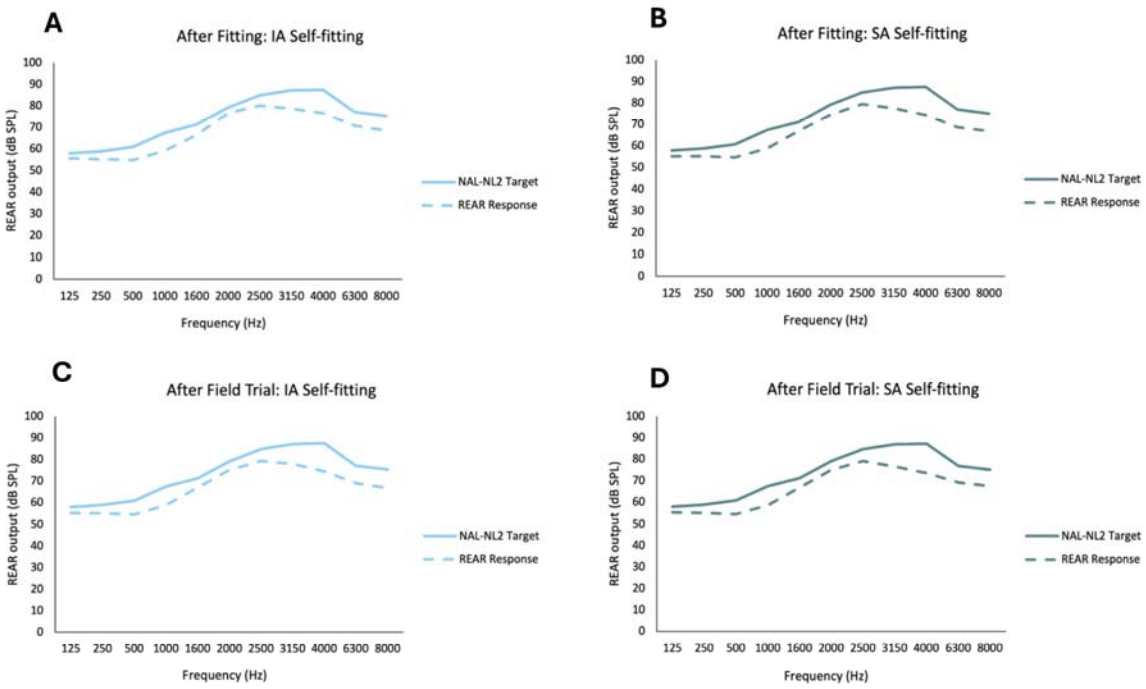
eFigure 2. The Lexie app interface for the in-situ audiometry self-fitting process. (A) The app prompted the participants to take a hearing test, (B) The app provided instructions to the participants for the in-situ hearing test using their hearing aids, (C) The app facilitated a practice round to ensure that the participants comprehend the instructions, (D) The app initiated the in-situ hearing test, (E) Based on the hearing test results, the app recommended personalized settings.



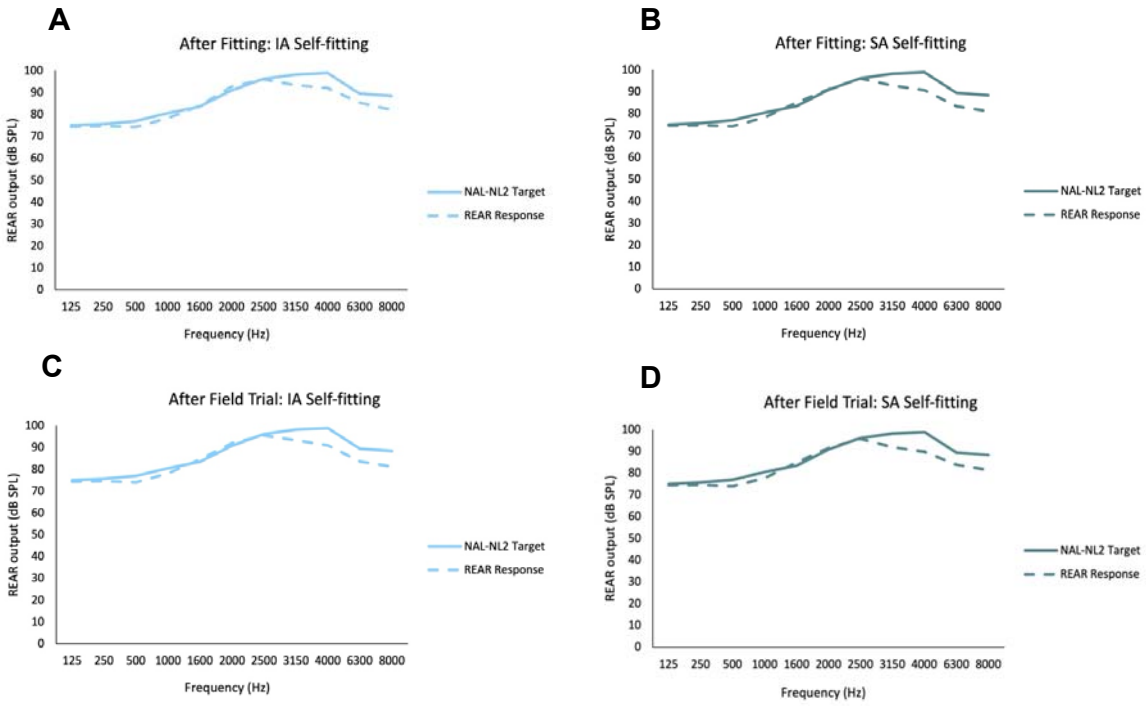
eFigure 3. (A) Distribution of conventional pure tone audiometric frequencies for the left ear, (B) Distribution of conventional pure tone audiometric frequencies for the right ear, n = 28. Standard deviations are shown as error bars.



eFigure 4. International Outcomes Inventory for Hearing Aids (IOI-HA) items for the in-situ audiometry (IA) self-fitting and self-adjustment (SA) self-fitting measured after approximately four weeks of hearing aid use. *Clinically meaningful advantage ($r \geq 0.3$).



eFigure 5. (A) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy immediately after fitting, (B) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy immediately after fitting, (C) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy after field trial, (D) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy after field trial. The stimulus was a 55 dB SPL International Speech Test Signal.



eFigure 6. (A) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy immediately after fitting, (B) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy immediately after fitting, (C) Comparison of NAL-NL2 target and real ear output in dB SPL for the in-situ audiometry self-fitting strategy after field trial, (D) Comparison of NAL-NL2 target and real ear output in dB SPL for the self-adjustment self-fitting strategy after field trial. The stimulus was a 75 dB SPL International Speech Test Signal.

eTable 1. DIN and QuickSIN Benefit Scores for the Self-Adjustment and In-situ Audiometry Self-fitting Strategies After Fitting and After Field Trial (n = 28)

	After Fitting: SA Self-fitting Median (Min – Max)	After Fitting: IA Self-fitting Median (Min – Max)	Effect size (95% CI)	After Trial: SA Self-fitting Median (Min – Max)	After Trial: IA Self-fitting Median (Min – Max)	Effect size (95% CI)
DIN	0.0 (-2.0 – 2.6)	0.3 (-3.8 – 4.6)	Cohen *d* = 0.0 (-0.4 – 0.4)	0.1 (-3.4 – 4.0)	0.3 (-3.6 – 2.8)	Cohen *d* = 0.2 (-0.1 – 0.6)
QuickSIN	0.0 (-5.0 – 4.3)	0.2 (-6.0 – 5.7)	Cohen *d* = -0.1 (-0.4 – 0.3)	0.8 (-5.0 – 5.0)	0.3 (-3.7 – 4.7)	Rosenthal's *r* = -0.1 (-0.3 – 0.2)

Abbreviation: DIN, Digits-in-Noise; QuickSIN, Quick Speech-in-Noise; SA, Self-adjustment; IA, In-situ Audiometry

eTable 2. CONSORT checklist of information to include when reporting randomised crossover trials

Section/topic	Item No	Description	Page No*
Title†	1a	Identification as a randomised crossover trial in the title	This study was not a true randomized controlled trial therefore it was only identified it as a crossover trial. See page 1.
Abstract†	1b	Specify a crossover design and report all information outlined in table 2	Page 2-4
Introduction:			
Background‡	2a	Scientific background and explanation of rationale	Page 5-6
Objectives‡	2b	Specific objectives or hypotheses	Page 5-6
Methods:			
Trial design†	3a	Rationale for a crossover design. Description of the design features including allocation ratio, especially the number and duration of periods, duration of washout period, and consideration of carry over effect	Page 7
Change from protocol‡	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	Page 8-9
Participants‡	4a	Eligibility criteria for participants	Page 7-8
Settings and location‡	4b	Settings and locations where the data were collected	Page 7-11
Interventions†	5	The interventions with sufficient details to allow replication, including how and when they were actually administered	Page 9-11
Outcomes‡	6a	Completely defined prespecified primary and secondary outcome measures, including how and when they were assessed	Page 11
Changes to outcomes‡	6b	Any changes to trial outcomes after the trial commenced, with reasons	N/A

Section/topic	Item No	Description	Page No*
Sample size†	7a	How sample size was determined, accounting for within participant variability	Page 8
Interim analyses and stopping guidelines‡	7b	When applicable, explanation of any interim analyses and stopping guidelines	N/A
Randomisation:			
Sequence generation‡	8a	Method used to generate the random allocation sequence	Page 8
Sequence generation‡	8b	Type of randomisation; details of any restriction (such as blocking and block size)	Page 8
Allocation concealment mechanism‡	9	Mechanism used to implement the random allocation sequence§ (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	Page 8
Implementation†	10	Who generated the random allocation sequence,§ who enrolled participants, and who assigned participants to the sequence of interventions	Page 8
Blinding‡	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	N/A
Similarity of interventions‡	11b	If relevant, description of the similarity of interventions	Page 9-11
Statistical methods†	12a	Statistical methods used to compare groups for primary and secondary outcomes which are appropriate for crossover design (that is, based on within participant comparison)	Page 11
Additional analyses‡	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	Page 11
Results			
Participant flow (a diagram is strongly recommended)†	13a	The numbers of participants who were randomly assigned, received intended treatment, and were	CONSORT flow diagram - Figure 1

Section/topic	Item No	Description	Page No*
		analysed for the primary outcome, separately for each sequence and period	
Losses and exclusions†	13b	No of participants excluded at each stage, with reasons, separately for each sequence and period	Page 8-9
Recruitment‡	14a	Dates defining the periods of recruitment and follow-up	Page 7-8
Trial end‡	14b	Why the trial ended or was stopped	Page 7
Baseline data†	15	A table showing baseline demographic and clinical characteristics by sequence and period	Table 1
Numbers analysed†	16	Number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	Tables 1-3 (n specified in titles).
Outcomes and estimation†	17a	For each primary and secondary outcome, results including estimated effect size and its precision (such as 95% confidence interval) should be based on within participant comparisons.¶ In addition, results for each intervention in each period are recommended	Page 11-14
Binary outcomes‡	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	Page 11-14
Ancillary analyses‡	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing prespecified from exploratory	Page 11-14
Harms†	19	Describe all important harms or untended effects in a way that accounts for the design (for specific guidance, see CONSORT for harms32)	N/A
Discussion:			
Limitations†	20	Trial limitations, addressing sources of potential bias, imprecision, and if relevant, multiplicity of analyses. Consider potential carry over effects	Page 16

Section/topic	Item No	Description	Page No*
Generalisability‡	21	Generalisability (external validity, applicability) of the trial findings	Page 14-17
Interpretation‡	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	Page 14-17
Other information:			
Registration‡	23	Registration number and name of trial registry	Page 7
Protocol‡	24	Where the full trial protocol can be accessed, if available	Page 7
Funding‡	25	Sources of funding and other support (such as supply of drugs), role of funders	Page 18

CONSORT=Consolidated Standards of Reporting Trials.

- * Note: page numbers are optional depending on journal requirements.
- † Modified original CONSORT item.
- ‡ Unmodified CONSORT item.
- § Random sequence here refers to a list of random orders, typically generated through a computer program. This should not be confused with the sequence of interventions in a randomised crossover trial, for example receiving intervention A before B for an individual trial participant.
- ¶ A within participant comparison takes into account the correlation between measurements for each participant because they act as their own control, therefore measurements are not independent.

eTable 3. Information to include in abstract of report of randomised crossover trial: extension of CONSORT for abstracts checklist

Item	Description	
Title*	Identification of study as a randomised crossover trial	This study was not a true randomized controlled trial therefore it was only identified it as a pseudo-randomized-crossover trial.
Trial design*	Description of the trial design (crossover trial and number of periods)	Design settings and participants
Methods:		
Participants†	Eligibility criteria for participants and the settings where the data were collected	Eligible participants specified under objectives Setting specified under design settings and participants
Interventions*	Interventions intended for all participants	Interventions
Objective†	Specific objective or hypothesis	Objectives
Outcome†	Clearly defined primary outcome for this report	Main outcomes and measures
Randomisation*	How participants were allocated to sequences	Design settings and participants
Blinding (masking)*	Whether or not participants, care givers, and those assessing the outcomes were blinded to intervention	N/A
Results:		
Numbers randomised*	Number of participants randomised to each sequence	Design settings and participants
Recruitment†	Trial status‡	Trial registration
Numbers analysed*	Number of participants analysed	Design settings and participants
Outcome*	For the primary outcome, the estimated effect size and its precision based on within participant comparisons	Results
Harms†	Important adverse events or side effects	N/A

Item	Description	
Conclusions†	General interpretation of the results	Conclusions and relevance
Trial registration†	Registration number and name of trial register	Trial registration
Funding†	Source of funding	Not specified in abstract as it is not within the journal's guidelines but specified in funding support section (Page 18).

CONSORT=Consolidated Standards of Reporting Trials.

- * Modified original CONSORT item.
- † Unmodified CONSORT item.
- ‡ This is applicable to conference abstracts.