Summary of intervention for speech difficulties using randomised controlled trials for people with Parkinson's – DRAFT FOR CONSULTATION

Study (first author/ date, NAME)	Participants (disease level, N=, controls)	Intervention (group-individual)	Primary outcome (main scale)	Results	Follow-up	Comments	Grade	Study limitations
Steurer H. et al (2024) Speech and neuroimaging effects following HiCommunication: a randomized controlled group intervention trial in Parkinson's disease	HiComm N=47 HiBalance N=48 H&Y stage 2	HiComm is a Group therapy aiming at louder and clearer speech	Loudness in reading and monologue	Significant improvement (3dBSPL) in reading and monologue for between group and time (pre-post-6 months) interactions	6 months with resting fMRI	Part of EXPANd trial, well designed study emphasising communication in groups	RCT high (14/22)	Need to see longer FU Small gains in sound level
Levy E et al (2020) The effects of intensive speech treatment on intelligibility in Parkinson's disease: A randomised controlled trial	N=64 H&Y stage 2	LSVT-LOUD versus LSVT-ARTIC	Intelligibility (from Transcription Accuracy-TA) rated by 117 listeners.	Significant changes in the TA for the LSVT LOUD group only	Pre-post treatment (no FU)	Well-designed RCT	RCT high (15/22)	Clinically applicable given the resources; no FU

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Schulz G et al (2021) Single Word Intelligibility of Individuals with Parkinson's Disease in Noise: Pre-Specified Secondary Outcome Variables from a Randomized Control Trial (RCT) Comparing Two Intensive Speech Treatments (LSVT LOUD vs. LSVT ARTIC)	N=64 Controls N=20	LSVT-LOUD versus LSVT-ARTIC	Single word intelligibility	Significant changes in single word intelligibility	Pre-post Treatment	Well-designed RCT	RCT high (15/22)	Clinically applicable given the resources; no FU

Study (first author/ date, NAME)	Participants (disease level, N=, controls)	Intervention (group-individual)	Primary outcome (main scale)	Results	Follow-up	Comments	Grade	Study limitations
Ramig L, et al (2001) Intensive voice treatment (LSVT) for patients with Parkinson's disease: a 2 year follow up	N=33 H&Y stage 2	LSVT-LOUD Versus LSVT-RESP	Vocal loudness	Significant changes for the LSVT LOUD group	24 months	First RCT with 24 months follow up	RCT high (16/22)	No control group of no treatment but long FU
Ramig et al (2018) Speech treatment in Parkinson's disease: Randomized controlled trial	N=64	LSVT-LOUD versus LSVT-ARTIC versus no Tx versus healthy controls (N=20)	Vocal loudness and CETI-M.	LSVT LOUD significantly improved vocal loudness in 1 and 7 months FU compared to baseline and LSVT ARTIC- no TX. CETI-M was not significantly different.	1 and 7 months		RCT high (17/22)	Clinically valuable given the resources

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Tamplin J et al (2020) ParkinSong: Outcomes of a 12-Month Controlled Trial of Therapeutic Singing Groups in Parkinson's Disease	N=75 PwP and 44 caregivers	2 dosage levels (weekly monthly)	Vocal loudness and QOL	PARKINSONG participants showed improvement in both PwP and caregivers.	12 months	First RCT with singing	RCT high (15/22)	Good design but not randomised
Tamplin et al (2024) ParkinSong online: Feasibility of telehealth delivery and remote data collection for a therapeutic singing study in Parkinson's.	N=28 PwP	Weekly, 90-minute sessions of ONLINE singing group	Vocal loudness and QOL	No improvement in vocal measures or wellbeing outcomes	12 weeks	Feasibility study for online delivery with limited numbers	RCT low (12/22)	Not randomised

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Brabenec et al (2021) Non-invasive brain stimulation for speech in Parkinson's disease: A randomized controlled trial	N=33 (20 in the real stimulation and 13 in the sham) stimulation group)	10 sessions of real or sham TMS in 2 weeks over the Rt superior Temporal gyrus	Phonetics: a scale for Articulation Prosody and speech intelligibility	Significant improvement	2, 6 and 10 weeks post	First RCT for TMS in the superior Temporal gyrus with	RCT low (14/22)	Short FU and difficulty implementing TMS in clinics

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Sackley et al (2023) Lee Silverman Voice Treatment versus NHS speech and language therapy versus control for dysarthria in people with Parkinson's disease (PD COMM): pragmatic, UK based, multicentre, three arm, parallel group, unblinded, randomised controlled trial.	N=130 for LSVT LOUD N=129 for "NHS speech therapy N=129 for no therapy	Depending on the arm	VHI score at 3 months	LSVT LOUD scores significant improvement in VHI scores than NHS or no therapy.	3 months	"pragmatic" RCT	RCT low (12/22)	Short FU Poorly defined treatment ("NHS therapy") and inadequate outcome (VHI)

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Maas et al. (2024) Effectiveness of remotely delivered speech therapy in persons with Parkinson's disease – a randomised controlled trial	N=109 in the "personalised intervention group" N=105 in the control group.	8 weeks of telemedicine	Primary outcome: disease-related Quality of Life at 8 weeks. (PDQ-39).	"personalised remote speech therapy improved communication-related QOL but not overall QOL"	Pre-post data no FU	RCT for delivering therapy remotely versus no therapy.	RCT low (14/22)	Treatment not well-defined Clinically applicable Includes carers No change in objective speech measures

Abbreviations

CETI-M	Modified communication effectiveness index
Tx	Treatment
ARTIC	Articulation
LSVT	Lee Silverman Voice Treatment
TMS	Transcranial magnetic stimulation
QoL	Quality of life
RCT	Randomised control trial
H&Y	Hohn and Yahr

Quality assessments of the included studies were performed with the adjusted PD-specific assessment form designed by Den Brok et al. (Mov Disord 2015), which was based on the Newcastle–Ottawa quality assessment scale (Wells et al. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in metaanalysis. [cited 2022 February 20]. Available from **ohri.ca/programs/clinical_epidemiology**). The scores range from 0 to 22, and higher scores indicate better study quality.