

Supplemental materials

Understanding what matters about freezing of gait in Parkinson's disease

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SUPPLEMENT A – PARTICIPANT INTERVIEW GUIDE INSTRUCTIONS AND QUESTIONS

Note: Below is a semi-structured interview guide. It is to be used as a guide only. The actual areas of conversation are fluid and may be discussed at moments different from the order appearing below. The interview will be approximately 90 minutes. The interviewer may adapt the guide in order to cover the topics in the amount of time allotted for the session or in order to best elicit concepts from the participants.

Prior to the start of the discussion, please check off:

Participant has been deemed eligible

☐ Yes ☐ No

Participant has consented prior to the discussion

☐ Yes ☐ No

Notes to Interviewer:

- This interview guide is meant to help guide the discussion, but not to be used as a verbatim script; probes and questions may change slightly depending on individual feedback.
- Additional unscripted probes to be used to gain further information or clarification may include:
 - **Clarification:** I don't quite understand that.
 - **Expressing understanding:** How did you cope with that?
 - **Justification:** Can you tell me a little bit more about why you chose that for your answer?
 - **Importance:** How important is this for you?
 - **Relationship:** I'm not sure how these 2 things are linked.
 - **Extending narrative:** Tell me a bit more about that.
 - **Accuracy:** Let's see if I've got that right.

Key for Interviewer:

- Questions/text to be asked of the participant
- *Notes to the interviewer (Do not read to participant)*

Introduction to Interview –

Review with participant prior to recording – summarize, don't read. This should be a casual conversation.

Thank you for taking the time to speak with me today. Before we can start with the interview let's go over the information for the study.

We are talking to people such as yourself who experience freezing of gait (FOG) due to Parkinson's disease. The purpose of our conversation today is to better understand the experience of FOG, how it affects you, and whether the new patient reported outcome measure adequately reflects your personal experiences of FOG.

It is expected that approximately 40-50 participants will be enrolled in this interview portion of the study. There are no treatments being tested in this study.

You are being asked to take part in one interview, which will be audio and screen recorded to ensure we capture everything you say accurately. The interview will take about 2 hours to complete. The recording will be transcribed and no names will appear in the written transcript. All your responses will be anonymous; your name will not be linked with any of your responses. Recording the interview is a required part of the study. If you do not want to be recorded, you may not take part in the study. If you wish, you may choose to allow your video recording to be shared in the future with other researchers for training or research purposes. In this case, a recording of your voice and the mapping process on the screen might be shared however, your identifying information will not be shared.

Sharing your video is completely optional and you are not required to share your video to be part of the study.

Your participation is voluntary, which means that you do not have to take part in the interview. You can skip any question you do not want to answer, and you can choose to stop the interview at any time.

☐ Before we proceed, do you have any questions?

Address all questions the participant has before proceeding.

Before we get started, I would like to reiterate that this session will be audio recorded. However, your name will not be linked with the recording, transcription, or your responses during the interview.

☐ Is it okay for me to record the conversation today? (this will be restated for recording)

If yes, continue to "Background for All Interviews."

If no: Unfortunately, since you do not agree to the recording of this session, you won't be able to participate in this study. Thank you for your willingness to consider participation in this study.

Background for Interview

- ☐ My role here is to ask questions and to listen. I will ask questions related to your experience and I will move the discussion from one question to the next to try to keep us on track so that we can finish on-time.
- ☐ I am not your medical doctor, so I am not qualified to give medical advice. I encourage you to follow-up with your regular doctor if you have any questions about your condition after this interview.
- ☐ Please feel free to let me know if you need a break. You can ask me questions at any time.

Any questions before we begin?

Begin Recorder:

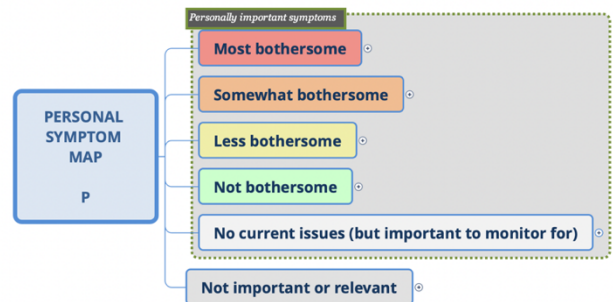
- ☐ Start Zoom recorder, start 2 digital voice recorders as back up if Zoom fails.
- ☐ This is participant ID *[insert ID number here]* for the FOG Study on *[Date, time]*.
- ☐ State interviewer initials.
- ☐ Do I have your permission to record this interview? **Verbal response required.**
- ☐ Can you confirm you read and signed the Informed Consent Form for the study? **Verbal response required.**
- ☐ Do you wish to have your audio/video recording shared with others for future training or research purposes?

Section 1. Personally Important Symptoms

I'm going to ask you to describe your symptoms, starting with symptoms related to walking, balance, and freezing. We will use this information to create a map or a "picture" of symptoms that are important to you, based upon what you tell me. (Map will be pre-populated with symptoms from the symptom survey)

[The interviewer will demonstrate technique and check:]

- ☐ Screen is at a comfortable reading size



In-depth review of gait/movement related symptoms

- ☐ 1. Please describe your experiences with FOG and any difficulties you have with moving, walking, or balance.

[Step 1 of the symptom mapping activity begins here.] As the participant directs, the interviewer will map the participants experiences.]

- ☐ Probes:

- What do you experience?
- What triggers it?
- How does it affect you? What makes it bothersome or not?
- How long does it last?
- How does it make you feel?
- What do you do when it happens? Do you do anything differently as a result?
- Does it affect your ability to do things? (limitations or compensating behaviors)
- Is anything missing?

Focused review of non-gait symptoms

☐ 2. Let's look at the other symptoms that you also experience.

[Briefly consider each symptom identified from the symptom survey. Add concise details showing how the experiences the symptom, how the symptom impacts or affects the person, and identify if that symptom is related to freezing of gait. If related to freezing of gait, indicate the relationship with connecting arrows].

- What do you notice with this?
- How does it affect you? (e.g., Get in the way or make it harder to do things)

Ranking of symptoms by bothersomeness

☐ 3. Now, let's order your symptoms by how important they are to you.

[The interviewer will rank the symptoms by bothersomeness, hierarchically, calling out symptoms that are particularly important to the individual with boundaries or summary brackets. Symptoms should be in fully collapsed state for this.]

Closing questions

☐ 6. How did you feel about the symptom mapping we did to today to describe your symptoms?

- a. What did you like or dislike about it?
- b. Are there any changes you think we should make to this technique?

☐ 7. Do you have any other thoughts or comments?

☐ 8. Do you want a copy of your map emailed to you?

Thank you for your time and for all the insightful information and experiences you have shared with me today. Now, let's discuss the next steps before we end the interview.

STATE FOR RECORDING: This concludes the interview and the recording.

[Stop recording and go through any closing logistical items with the participant.]

Supplement B.

All Symptoms reported by Participants with Freezing of gait by relative bothersomeness

MOVEMENT DOMAIN	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
SLOW MOVEMENT	90%	5%	29%	24%	32%
LOSS OF COORDINATION	32%	.	7%	7%	17%
FINE MOTOR/DEXTERITY	93%	7%	10%	37%	39%
Fine Motor/Dexterity	68%	.	7%	29%	32%
Handwriting changes	88%	15%	15%	37%	22%
STIFFNESS	93%	.	12%	44%	37%
Stiffness/Rigidity	85%	.	24%	42%	20%
Decreased range of motion	73%	2%	27%	24%	20%
Decreased facial expression	54%	5%	20%	20%	10%
Impaired eye movements	.	.	.	.	.
WALKING, BALANCE & POSTURE	100%	.	2%	12%	85%
Impaired balance	98%	.	17%	27%	54%
Gait changes	100%	.	10%	17%	73%
Shuffling	46%	.	7%	12%	27%
Dragging feet	12%	.	.	2%	10%
Altered stride length	34%	.	7%	5%	22%
Altered stance	10%	.	2%	.	7%
Altered turning	78%	.	5%	17%	56%
Altered double support time	5%	.	2%	.	2%
Staggering	5%	.	2%	.	2%
Freezing of gait	100%	.	5%	27%	68%
Altered gait velocity	54%	2%	7%	5%	39%
Altered arm Swing	68%	20%	24%	17%	7%
Postural changes	68%	7%	15%	37%	10%
TREMOR	71%	12%	17%	24%	17%
Tremor	66%	12%	20%	22%	12%
hand tremor	51%	10%	12%	20%	10%
face tremor	7%	.	5%	.	2%
leg tremor	20%	5%	7%	5%	2%
arm tremor	10%	.	5%	.	5%
FOG occurs with tremor	10%	.	.	5%	5%
Sense of internal tremor	34%	5%	15%	12%	2%
OTHER INVOLUNTARY MOVEMENT	85%	5%	20%	32%	29%
Cramping/spasm	63%	2%	22%	27%	12%
Restless legs	49%	10%	17%	17%	5%
Twitching	29%	7%	17%	5%	.
Dyskinesias	54%	7%	20%	10%	17%
Dystonia	5%	.	.	.	5%
Toe stiffness/curling	10%	.	.	.	10%
MOVEMENT SYMPTOMS NOT IN MODEL	.	.	.	.	.
Proprioception	12%	.	5%	2%	5%

Supplement B.

All Symptoms reported by Participants with Freezing of gait by relative bothersomeness

COGNITIVE DOMAIN

	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
MEMORY	56%	5%	5%	39%	7%
Impaired memory	56%	5%	5%	39%	7%
Forgetting to do things	10%	.	.	10%	.
Impaired visual Memory	.	.	.	.	.
Trouble learning	.	.	.	.	.
EXECUTIVE FUNCTION	68%	5%	10%	42%	12%
Decreased mental flexibility	5%	.	.	2%	2%
impaired ability to multitask	68%	5%	10%	42%	12%
LANGUAGE	80%	7%	15%	44%	15%
Difficulty word finding	80%	7%	15%	44%	15%
VISUOSPATIAL	25%	.	10%	10%	5%
Impaired depth perception	20%	.	7%	10%	2%
Difficulty finding way	12%	.	10%	.	2%
ATTENTION & PROCESSING	76%	7%	12%	42%	15%
Impaired attention	.	.	.	.	.
Impaired concentration	54%	5%	7%	34%	7%
Slower thinking	63%	5%	7%	37%	15%
Impaired mental alertness (fog)	54%	2%	7%	32%	12%
COGNITIVE SYMPTOMS NOT IN MODEL	.	.	.	.	.
Changes in Thinking	73%	5%	10%	44%	15%
Trouble decision-making	2%	2%	.	.	.

Supplement B.

All Symptoms reported by Participants with Freezing of gait by relative bothersomeness

PSYCHIATRIC DOMAIN

	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
MOOD & AFFECT	78%	10%	24%	27%	17%
Apathy	49%	5%	15%	20%	10%
Loss of interest	49%	5%	15%	20%	10%
Decreased goal directed behavior	.	.	.	.	.
Anxious mood	56%	10%	20%	17%	10%
Social phobia	.	.	.	.	.
Panic	7%	.	.	2%	5%
Excessive worrying	12%	.	.	7%	5%
Depressed mood	49%	.	15%	24%	10%
Low or flat mood	2%	.	.	2%	.
Feelings of sadness	2%	.	.	.	2%
Loss of pleasure	27%	5%	5%	15%	2%
Negative feelings/emotions	39%	.	12%	15%	12%
Suicidal ideation/thoughts of death	.	.	.	.	.
Emotional lability	34%	5%	12%	10%	7%
Pseudobulbar affect	.	.	.	.	.
Irritability	5%	.	5%	.	.
Euphoria	.	.	.	.	.
Agitation	.	.	.	.	.
BEHAVIOR CHANGES	20%	7%	7%	5%	.
Impulsive-compulsive behaviors	20%	7%	7%	5%	.
Medication use	2%	.	2%	.	.
Buying	7%	2%	2%	2%	.
Eating	2%	.	2%	.	.
Sexual	5%	.	2%	2%	.
Punding	.	.	.	.	.
Gambling	.	.	.	.	.
Walkabout	.	.	.	.	.
Hobbyism	2%	2%	.	.	.
Subsyndromal ICD	.	.	.	.	.
ICD	.	.	.	.	.
Disease focused	2%	.	.	2%	.
verbal/intellectual aggression	2%	.	2%	.	.
PSYCHOSIS	2%	.	.	2%	.
Psychosis	2%	.	.	2%	.
Minor psychosis	.	.	.	.	.
Delusions	.	.	.	.	.
Hallucinations	2%	.	.	2%	.
PERSONALITY CHANGES	10%	.	.	7%	2%
Personality changes	10%	.	.	7%	2%
Excessive persistence	.	.	.	.	.
Reward seeking behavior	.	.	.	.	.
Disinhibitions	.	.	.	.	.
Neuroticism	.	.	.	.	.
Impaired emotion recognition	.	.	.	.	.
Low novelty seeking	.	.	.	.	.
PSYCH SYMPTOMS NOT IN MODEL	.	.	.	.	.
Frustration	59%	7%	17%	17%	17%

Supplement B.

All Symptoms reported by Participants with Freezing of gait by relative bothersomeness

SENSORY DOMAIN

	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
FIVE SENSES	.	.	.	.	.
Vision	22%	12%	2%	2%	5%
Light sensitivity	.	.	.	.	.
Double vision	12%	2%	2%	2%	5%
Dry eyes	20%	7%	5%	2%	5%
Watery eyes	7%	.	2%	.	5%
Altered taste	27%	5%	17%	5%	.
Altered smell	51%	15%	32%	2%	2%
Impaired hearing	15%	7%	2%	5%	.
Impaired sensation	22%	.	7%	15%	.
Impaired sensation in hands/feet	17%	.	5%	12%	.
Impaired vibratory sense	.	.	.	.	.
Numbness	10%	.	5%	5%	.
Impaired temperature sensation	5%	.	2%	2%	.
Tingling	.	.	.	.	.
OTHER SENSATIONS	.	.	.	.	.
Pain (general)	29%	.	7%	7%	15%
Headaches	.	.	.	.	.
Fatigue/lack of energy	71%	5%	17%	27%	22%
Physical fatigue	39%	5%	5%	12%	17%
Mental fatigue	10%	.	2%	2%	5%
Breathlessness (dyspnea)	32%	5%	10%	12%	5%
Muscle weakness	39%	5%	12%	15%	7%
Heaviness	.	.	.	.	.
Impaired body temperature control	39%	5%	20%	5%	10%
Heat intolerance	20%	.	10%	.	10%
Cold intolerance	22%	2%	12%	2%	5%
SENSORY SYMPTOMS NOT IN MODEL	.	.	.	.	.
Feedback loop issue with brain and external temp	2%	.	2%	.	.
Pain in Feet	7%	.	.	2%	5%
Back pain	2%	.	2%	.	.

SLEEP DOMAIN

	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
SLEEP DISTURBANCES	71%	2%	22%	34%	12%
Reduced sleep quality	56%	2%	17%	24%	12%
Insomnia	68%	2%	22%	34%	10%
Difficulty falling asleep	34%	.	7%	17%	10%
Difficulty staying asleep	61%	2%	17%	32%	10%
Early morning awakening	2%	.	.	2%	.
Altered sleep duration and efficiency	44%	2%	17%	20%	5%
Sleep walking	.	.	.	.	.
RSBD	49%	17%	22%	10%	.
REM Sleep Behavior Disorder (RBD)	29%	17%	5%	7%	.
Acting out dreams	44%	12%	22%	10%	.
Dreaming	.	.	.	.	.
Vivid dreams	34%	20%	5%	10%	.
Unpleasant dreams	10%	5%	2%	2%	.
DAYTIME SLEEPINESS	46%	.	22%	17%	7%
SLEEP SYMPTOMS NOT IN MODEL	.	.	.	.	.

Supplement B.

All Symptoms reported by Participants with Freezing of gait by relative bothersomeness

SPEECH DOMAIN

	-----Present-----				
	Not Present	Not Bothersome	Less Bothersome	Somewhat Bothersome	Most Bothersome
	0	1	2	3	4
SPEECH CHANGES	41%	2%	12%	15%	12%
Impaired articulation	22%	2%	10%	7%	2%
Impaired verbal fluency	5%	.	.	5%	.
Difficulty forming sounds	17%	.	2%	5%	10%
VOICE CHANGES	81%	15%	22%	20%	24%
Impaired phonation	2%	.	2%	.	.
Monotone (Prosodic impairment)	32%	2%	7%	10%	12%
Quiet voice	71%	12%	20%	15%	24%
Altered voice quality	46%	2%	12%	12%	20%
SPEECH SYMPTOMS NOT IN MODEL	.	.	.	.	.
Mumbled speech	7%	.	2%	5%	.
Slower speech	10%	.	5%	2%	2%
Freezing of speech	2%	.	.	2%	.
Stuttering	5%	.	.	5%	.
Slurring	5%	2%	.	.	2%
Faster speech	5%	.	.	2%	2%
Hard to inflect	2%	.	.	2%	.

DIGESTIVE DOMAIN

	-----Present-----				
	Not Present	Not Bothersome	Less Bothersome	Somewhat Bothersome	Most Bothersome
	0	1	2	3	4
MOUTH & THROAT SYMPTOMS	81%	17%	24%	24%	15%
Saliva control	66%	20%	22%	17%	7%
Drooling	51%	17%	20%	10%	5%
Dry mouth	42%	7%	20%	10%	5%
Chewing & Swallowing	29%	5%	7%	12%	5%
Chewing	.	.	.	.	.
Globus sensation	.	.	.	.	.
Dysphagia	20%	.	7%	10%	2%
Impaired swallowing	32%	5%	10%	12%	5%
Choking	27%	2%	10%	10%	5%
Pain during swallow	.	.	.	.	.
Altered esophageal transit time	2%	.	2%	.	.
Eating problems NOS	2%	.	2%	.	.
STOMACH SYMPTOMS	20%	.	15%	5%	.
Acid reflux/heartburn	.	.	.	.	.
Early fullness (satiety)	5%	.	5%	.	.
Abdominal pain	.	.	.	.	.
Nausea & Vomiting	.	.	.	.	.
Bloating/fullness	.	.	.	.	.
Appetite changes	20%	.	15%	5%	.
BOWEL SYMPTOMS	78%	7%	29%	17%	24%
Constipation	78%	7%	29%	17%	24%
Tenesmus	.	.	.	.	.
Straining during BM	.	.	.	.	.
Problems with bowel emptying	2%	.	.	.	2%
Bowel urgency	.	.	.	.	.
Bowel incontinence	5%	.	2%	.	2%
Impaired anal sphincter control	.	.	.	.	.
Diarrhea	.	.	.	.	.
General GI dysfunction	.	.	.	.	.
DIGESTIVE SYMPTOMS NOT IN MODEL	.	.	.	.	.
Extra saliva in mouth	5%	2%	2%	.	.

Supplement B.

All Symptoms reported by Participants with Freezing of gait by relative bothersomeness

URINARY DOMAIN

	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
URINARY DYSFUNCTION	85%	10%	24%	37%	15%
Urinary frequency	73%	7%	17%	34%	15%
Urinary urgency	7%	2%	.	5%	.
Nocturia	63%	5%	20%	27%	12%
Incomplete voiding	.	.	.	.	.
Urinary incontinence	34%	.	5%	20%	10%
Urinary infections	.	.	.	.	.
Weak urine stream	.	.	.	.	.
URINARY SYMPTOMS NOT IN MODEL	.	.	.	.	.

SEXUAL DOMAIN

	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
SEXUAL DYSFUNCTION	68%	22%	17%	20%	10%
Anorgasmia	39%	10%	7%	12%	10%
Ejaculatory dysfunction	2%	2%	.	.	.
Erectile dysfunction (Male)	15%	2%	2%	7%	2%
Impaired libido	39%	10%	10%	12%	7%
Vaginal dryness (Female)	2%	.	.	2%	.
SEXUAL SYMPTOMS NOT IN MODEL	.	.	.	.	.
Legs shake during sex	2%	.	.	2%	.

AUTONOMIC & CV DOMAIN

	-----Present-----				
	Not Present 0	Not Bothersome 1	Less Bothersome 2	Somewhat Bothersome 3	Most Bothersome 4
CARDIOVASCULAR SYMPTOMS	12%	.	7%	.	5%
Blood pressure regulation	5%	.	2%	.	2%
Hypotension	2%	.	.	.	2%
Orthostatic hypotension	5%	.	2%	.	2%
Orthostatic symptoms	10%	.	5%	.	5%
Hypertension	.	.	.	.	.
Supine hypertension	.	.	.	.	.
Nocturnal hypertension	.	.	.	.	.
Change in nocturnal BP	.	.	.	.	.
Lower extremity swelling	.	.	.	.	.
LIGHTHEADED, DIZZY, FAINTING	12%	.	2%	.	10%
Dizziness	7%	.	2%	.	5%
Lightheadedness	10%	.	2%	.	7%
Lightheadedness with long standing	.	.	.	.	.
Fainting/Syncope	.	.	.	.	.
SWEATING/HYPERHIDROSIS	.	.	.	.	.
AUTONOMIC SYMPTOMS NOS	.	.	.	.	.
ANS AND CV SYPTOMS NOT IN MODEL	.	.	.	.	.
Postural Hypertension	2%	.	2%	.	.
Unsteady feeling (not specific lighthead or dizzy)	2%	.	.	.	2%

Supplement C. FOG Context

CONTEXTUAL FACTORS R/T FOG	(N)/41	%
Difficulty changing directions or turning	36	88%
Difficulty navigating narrow spaces	26	63%
Changing thinking (sing, breath) will offset FOG	14	34%
Difficulty navigating uneven terrain	11	27%
Difficulty to navigate sideways	9	22%
FOG occurs on both sides	9	22%
FOG occurs more in left foot/leg	8	20%
Less FOG if using assistive aid (grocery cart)	8	20%
Difficulty with changing terrain/surfaces	7	17%
Specific shoes/surfaces can cause more FOG	7	17%
Difficulty taking small steps	6	15%
FOG occurs on dominate side	6	15%
FOG occurs more in right foot/leg	5	12%
Lifting knees or marching helps FOG	5	12%
Difficulty sitting down	4	10%
Exercise helps FOG	4	10%
Difficulty with stairs	3	7%
FOG rarely occurs outside	2	5%
Moving feet side-ways helps FOG	2	5%
Taking full size step helps resolve FOG	2	5%
Leaning forward to force feet to move helps FOG	1	2%

FOG EPISODES	(N)/41	%
FOG occurs situationally	31	76%
FOG occurs in specific places	22	54%
FOG lasts seconds	15	37%
FOG occurs during OFF periods	15	37%
FOG occurs more at evening/night	9	22%
FOG occurs in mornings/early afternoon	5	12%
FOG onset age > 70 years	5	12%
FOG occurs randomly	4	10%
FOG happens daily	3	7%
FOG doesn't happen often	2	5%
FOG worse after physical paces	2	5%

Supplement C. FOG Context

TRIGGERS/PROVOCATIVE CIRCUMSTANCE	(N)/41	%
FOG occurs in narrow or tight spaces	26	63%
FOG occurs when initiation motion	20	49%
FOG varies when turning	17	41%
FOG occurs when trying to get out of chair or car	11	27%
FOG occurs with dual-tasking, multi-tasking	11	27%
FOG triggered by shuffling gait	10	24%
FOG occurs with prolonged sitting or standing	10	24%
FOG triggered by fatigue/tiredness	9	22%
FOG occurs when carrying something in hands	8	20%
FOG occurs in big crowds/crowded places	8	20%
Thinking about freezing triggers it	7	17%
FOG triggered by stress	6	15%
FOG occurs during exercise	6	15%
FOG triggered by fear of falling	5	12%
FOG occurs under time pressures	5	12%
FOG occurs when hesitate with decision making	4	10%
FOG affects walking backward	4	10%
FOG triggered by severe pain	3	7%
FOG occurs when movement is not natural	3	7%
FOG occurs when getting out of bed	3	7%
FOG triggered by new situations	2	5%
FOG occurs when turning to sit in chair	2	5%
FOG occurs with distractions	2	5%
FOG worse when can't see feet or decrease vision	2	5%
FOG occurs when need to slow gait	2	5%
FOG occur when walking behind others	2	5%
FOG triggered by looking at gap btw elevator/floor	1	2%
FOG triggered by cold (tile) floor	1	2%
FOG triggered by medication (sinemet)	1	2%
FOG occurs from standing to seated position	1	2%
FOG worse with decreased vision, i.e. appears in perph not directly in front	1	2%
FOG occurs when shifting weight from leg to other	0	0%

Supplement D. Relationships between Freezing of Gait and other PD symptoms as identified in Symptom maps

MOVEMENT DOMAIN	Related to				
	Not related to FOG	"Freezing" but not FOG specific	Symptom Impacts FOG	FOG Impacts Symptom	Reciprocal Impact
SLOW MOVEMENT	56.10%	4.90%	12.20%	22.00%	4.90%
LOSS OF COORDINATION	90.20%	4.90%	0.00%	4.90%	0.00%
FINE MOTOR/DEXTERITY	85.40%	14.60%	0.00%	0.00%	0.00%
Fine Motor/Dexterity	87.80%	12.20%	0.00%	0.00%	0.00%
Handwriting changes	95.10%	4.90%	0.00%	0.00%	0.00%
STIFFNESS	58.50%	7.30%	9.80%	19.50%	4.90%
Stiffness/Rigidity	70.70%	7.30%	12.20%	9.80%	0.00%
Decreased range of motion	80.50%	2.40%	2.40%	9.80%	4.90%
Decreased facial expression	92.70%	4.90%	0.00%	2.40%	0.00%
Impaired eye movements	100.00%	0.00%	0.00%	0.00%	0.00%
WALKING, BALANCE & POSTURE	0.00%	0.00%	0.00%	68.30%	31.70%
Impaired balance	24.40%	0.00%	4.90%	48.80%	22.00%
Gait changes	14.60%	0.00%	9.80%	68.30%	7.30%
Shuffling	68.30%	0.00%	12.20%	17.10%	2.40%
Dragging feet	90.20%	0.00%	4.90%	4.90%	0.00%
Altered stride length	75.60%	0.00%	7.30%	14.60%	2.40%
Altered stance	92.70%	0.00%	0.00%	7.30%	0.00%
Altered turning	22.00%	0.00%	29.30%	46.30%	2.40%
Altered double support time	95.10%	0.00%	0.00%	4.90%	0.00%
Staggering	97.60%	0.00%	0.00%	2.40%	0.00%
Freezing of gait	2.40%	0.00%	0.00%	100.00%	2.40%
Altered gait velocity	65.90%	0.00%	4.90%	29.30%	0.00%
Altered arm Swing	95.10%	2.40%	0.00%	2.40%	0.00%
Postural changes	87.80%	0.00%	4.90%	2.40%	4.90%
TREMOR	90.20%	0.00%	0.00%	9.80%	0.00%
Tremor	92.70%	0.00%	2.40%	2.40%	2.40%
hand tremor	92.70%	0.00%	2.40%	2.40%	2.40%
face tremor	100.00%	0.00%	0.00%	0.00%	0.00%
leg tremor	100.00%	0.00%	0.00%	0.00%	0.00%
arm tremor	100.00%	0.00%	0.00%	0.00%	0.00%
FOG occurs with tremor	92.70%	0.00%	0.00%	4.90%	2.40%
Sense of internal tremor	97.60%	0.00%	0.00%	2.40%	0.00%
OTHER INVOLUNTARY MOVEMENT	82.90%	2.40%	7.30%	4.90%	2.40%
Cramping/spasm	92.70%	2.40%	2.40%	2.40%	0.00%
Restless legs	100.00%	0.00%	0.00%	0.00%	0.00%
Twitching	100.00%	0.00%	0.00%	0.00%	0.00%
Dyskinesias	95.10%	0.00%	2.40%	0.00%	2.40%
Dystonia	100.00%	0.00%	0.00%	0.00%	0.00%
Toe stiffness/curling	92.70%	0.00%	2.40%	4.90%	0.00%
Proprioception	90.20%	0.00%	2.40%	2.40%	4.90%
COGNITIVE DOMAIN	Related to				
	Not related to FOG	"Freezing" but not FOG specific	Symptom Impacts FOG	FOG Impacts Symptom	Reciprocal Impact
MEMORY	97.60%	2.40%	0.00%	0.00%	0.00%
Impaired memory	97.60%	2.40%	0.00%	0.00%	0.00%
Forgetting to do things	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired visual Memory	100.00%	0.00%	0.00%	0.00%	0.00%
Trouble learning	100.00%	0.00%	0.00%	0.00%	0.00%
EXECUTIVE FUNCTION	75.60%	4.90%	9.80%	7.30%	2.40%
Decreased mental flexibility	100.00%	0.00%	0.00%	0.00%	0.00%
impaired ability to multitask	75.60%	4.90%	9.80%	7.30%	2.40%
LANGUAGE	90.20%	9.80%	0.00%	0.00%	0.00%
Difficulty word finding	90.20%	9.80%	0.00%	0.00%	0.00%
VISUOSPATIAL	95.10%	2.40%	0.00%	2.40%	0.00%
Impaired depth perception	95.10%	2.40%	0.00%	2.40%	0.00%
Difficulty finding way	100.00%	0.00%	0.00%	0.00%	0.00%
ATTENTION & PROCESSING	92.70%	4.90%	0.00%	2.40%	0.00%
Impaired attention	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired concentration	95.10%	4.90%	0.00%	0.00%	0.00%
Slower thinking	95.10%	4.90%	0.00%	0.00%	0.00%
Impaired mental alertness (fog)	95.10%	2.40%	0.00%	2.40%	0.00%
DIAGNOSTIC CLASSIFICATION	100.00%	0.00%	0.00%	0.00%	0.00%
Mild cognitive impairment	100.00%	0.00%	0.00%	0.00%	0.00%
Dementia	100.00%	0.00%	0.00%	0.00%	0.00%
Changes in Thinking	82.90%	7.30%	2.40%	4.90%	2.40%
Trouble decision-making	100.00%	0.00%	0.00%	0.00%	0.00%

Supplement D. Relationships between Freezing of Gait and other PD symptoms as identified in Symptom maps

		Related to			
	Not related	"Freezing" but	Symptom	FOG Impacts	Reciprocal
PSYCHIATRIC DOMAIN	to FOG	not FOG specific	Impacts FOG	Symptom	Impact
MOOD & AFFECT	65.90%	0.00%	12.20%	17.10%	4.90%
Apathy	85.40%	0.00%	0.00%	14.60%	0.00%
Loss of interest	85.40%	0.00%	0.00%	14.60%	0.00%
Decreased goal directed behavior	100.00%	0.00%	0.00%	0.00%	0.00%
Anxious mood	70.70%	0.00%	12.20%	12.20%	4.90%
Social phobia	100.00%	0.00%	0.00%	0.00%	0.00%
Panic	92.70%	0.00%	2.40%	4.90%	0.00%
Excessive worrying	87.80%	0.00%	2.40%	9.80%	0.00%
Depressed mood	85.40%	0.00%	0.00%	14.60%	0.00%
Low or flat mood	97.60%	0.00%	0.00%	2.40%	0.00%
Feelings of sadness	97.60%	0.00%	0.00%	2.40%	0.00%
Loss of pleasure	90.20%	0.00%	0.00%	9.80%	0.00%
Negative feelings/emotions	90.20%	0.00%	0.00%	9.80%	0.00%
Suicidal ideation/thoughts of death	100.00%	0.00%	0.00%	0.00%	0.00%
Emotional lability	90.20%	0.00%	0.00%	9.80%	0.00%
Pseudobulbar affect	100.00%	0.00%	0.00%	0.00%	0.00%
Irritability	95.10%	0.00%	0.00%	4.90%	0.00%
Euphoria	100.00%	0.00%	0.00%	0.00%	0.00%
Agitation	100.00%	0.00%	0.00%	0.00%	0.00%
BEHAVIOR CHANGES	97.60%	2.40%	0.00%	0.00%	0.00%
Impulsive-compulsive behaviors	100.00%	0.00%	0.00%	0.00%	0.00%
Medication use	100.00%	0.00%	0.00%	0.00%	0.00%
Buying	100.00%	0.00%	0.00%	0.00%	0.00%
Eating	100.00%	0.00%	0.00%	0.00%	0.00%
Sexual	100.00%	0.00%	0.00%	0.00%	0.00%
Punding	100.00%	0.00%	0.00%	0.00%	0.00%
Gambling	100.00%	0.00%	0.00%	0.00%	0.00%
Walkabout	100.00%	0.00%	0.00%	0.00%	0.00%
Hobbyism	100.00%	0.00%	0.00%	0.00%	0.00%
Subsyndromal ICD	100.00%	0.00%	0.00%	0.00%	0.00%
ICD	100.00%	0.00%	0.00%	0.00%	0.00%
Disease focused	97.60%	2.40%	0.00%	0.00%	0.00%
verbal/intellectual aggression	100.00%	0.00%	0.00%	0.00%	0.00%
PSYCHOSIS	100.00%	0.00%	0.00%	0.00%	0.00%
Psychosis	100.00%	0.00%	0.00%	0.00%	0.00%
Minor psychosis	100.00%	0.00%	0.00%	0.00%	0.00%
Delusions	100.00%	0.00%	0.00%	0.00%	0.00%
Hallucinations	100.00%	0.00%	0.00%	0.00%	0.00%
PERSONALITY CHANGES	97.60%	0.00%	0.00%	2.40%	0.00%
Personality changes	97.60%	0.00%	0.00%	2.40%	0.00%
Excessive persistence	100.00%	0.00%	0.00%	0.00%	0.00%
Reward seeking behavior	100.00%	0.00%	0.00%	0.00%	0.00%
Disinhibitions	100.00%	0.00%	0.00%	0.00%	0.00%
Neuroticism	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired emotion recognition	100.00%	0.00%	0.00%	0.00%	0.00%
Low novelty seeking	100.00%	0.00%	0.00%	0.00%	0.00%
Frustration	78.00%	0.00%	2.40%	19.50%	0.00%
		Related to			
	Not related	"Freezing" but	Symptom	FOG Impacts	Reciprocal
SENSORY DOMAIN	to FOG	not FOG specific	Impacts FOG	Symptom	Impact
FIVE SENSES	100.00%	0.00%	0.00%	0.00%	0.00%
Vision	100.00%	0.00%	0.00%	0.00%	0.00%
Light sensitivity	100.00%	0.00%	0.00%	0.00%	0.00%
Double vision	100.00%	0.00%	0.00%	0.00%	0.00%
Dry eyes	100.00%	0.00%	0.00%	0.00%	0.00%
Watery eyes	100.00%	0.00%	0.00%	0.00%	0.00%
Altered taste	100.00%	0.00%	0.00%	0.00%	0.00%
Altered smell	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired hearing	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired sensation	97.60%	0.00%	0.00%	2.40%	0.00%
Impaired sensation in hands/feet	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired vibratory sense	100.00%	0.00%	0.00%	0.00%	0.00%
Numbness	97.60%	0.00%	0.00%	2.40%	0.00%
Impaired temperature sensation	100.00%	0.00%	0.00%	0.00%	0.00%
Tingling	100.00%	0.00%	0.00%	0.00%	0.00%
OTHER SENSATIONS	100.00%	0.00%	0.00%	0.00%	0.00%
Pain (general)	90.20%	0.00%	4.90%	4.90%	0.00%
Headaches	100.00%	0.00%	0.00%	0.00%	0.00%

Supplement D. Relationships between Freezing of Gait and other PD symptoms as identified in Symptom maps

Fatigue/lack of energy	73.20%	0.00%	24.40%	0.00%	2.40%
Physical fatigue	75.60%	0.00%	22.00%	0.00%	2.40%
Mental fatigue	92.70%	0.00%	4.90%	0.00%	2.40%
Breathlessness (dyspnea)	95.10%	0.00%	2.40%	2.40%	0.00%
Muscle weakness	95.10%	2.40%	0.00%	2.40%	0.00%
Heaviness	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired body temperature control	97.60%	0.00%	2.40%	0.00%	0.00%
Heat intolerance	97.60%	0.00%	2.40%	0.00%	0.00%
Cold intolerance	97.60%	0.00%	2.40%	0.00%	0.00%
Feedback loop issue with brain and external temp	100.00%	0.00%	0.00%	0.00%	0.00%
Pain in Feet	92.70%	0.00%	2.40%	4.90%	0.00%
Back pain	100.00%	0.00%	0.00%	0.00%	0.00%

	Not related to FOG	Related to		FOG Impacts Symptom	Reciprocal Impact
		"Freezing" but not FOG specific	Symptom Impacts FOG		
SLEEP DOMAIN					
SLEEP DISTURBANCES	92.70%	0.00%	7.30%	0.00%	0.00%
Reduced sleep quality	95.10%	0.00%	4.90%	0.00%	0.00%
Insomnia	97.60%	0.00%	2.40%	0.00%	0.00%
Difficulty falling asleep	97.60%	0.00%	2.40%	0.00%	0.00%
Difficulty staying asleep	95.10%	0.00%	4.90%	0.00%	0.00%
Early morning awakening	100.00%	0.00%	0.00%	0.00%	0.00%
Altered sleep duration and efficiency	97.60%	0.00%	2.40%	0.00%	0.00%
Sleep walking	100.00%	0.00%	0.00%	0.00%	0.00%
RSBD	100.00%	0.00%	0.00%	0.00%	0.00%
REM Sleep Behavior Disorder (RBD)	100.00%	0.00%	0.00%	0.00%	0.00%
Acting out dreams	100.00%	0.00%	0.00%	0.00%	0.00%
Dreaming	100.00%	0.00%	0.00%	0.00%	0.00%
Vivid dreams	100.00%	0.00%	0.00%	0.00%	0.00%
Unpleasant dreams	100.00%	0.00%	0.00%	0.00%	0.00%
DAYTIME SLEEPINESS	100.00%	0.00%	0.00%	0.00%	0.00%

	Not related to FOG	Related to		FOG Impacts Symptom	Reciprocal Impact
		"Freezing" but not FOG specific	Symptom Impacts FOG		
SPEECH DOMAIN					
SPEECH CHANGES	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired articulation	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired verbal fluency	100.00%	0.00%	0.00%	0.00%	0.00%
Difficulty forming sounds	100.00%	0.00%	0.00%	0.00%	0.00%
VOICE CHANGES	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired phonation	100.00%	0.00%	0.00%	0.00%	0.00%
Monotone (Prosodic impairment)	100.00%	0.00%	0.00%	0.00%	0.00%
Quiet voice	100.00%	0.00%	0.00%	0.00%	0.00%
Altered voice quality	100.00%	0.00%	0.00%	0.00%	0.00%
Mumbled speech	100.00%	0.00%	0.00%	0.00%	0.00%
Slower speech	100.00%	0.00%	0.00%	0.00%	0.00%
Freezing of speech	97.60%	2.40%	0.00%	0.00%	0.00%
Stuttering	97.60%	2.40%	0.00%	0.00%	0.00%
Slurring	100.00%	0.00%	0.00%	0.00%	0.00%
Faster speech	100.00%	0.00%	0.00%	0.00%	0.00%
Hard to inflect	100.00%	0.00%	0.00%	0.00%	0.00%

	Not related to FOG	Related to		FOG Impacts Symptom	Reciprocal Impact
		"Freezing" but not FOG specific	Symptom Impacts FOG		
DIGESTIVE DOMAIN					
MOUTH & THROAT SYMPTOMS	97.60%	2.40%	0.00%	0.00%	0.00%
Saliva control	100.00%	0.00%	0.00%	0.00%	0.00%
Drooling	100.00%	0.00%	0.00%	0.00%	0.00%
Dry mouth	100.00%	0.00%	0.00%	0.00%	0.00%
Chewing & Swallowing	97.60%	2.40%	0.00%	0.00%	0.00%
Chewing	100.00%	0.00%	0.00%	0.00%	0.00%
Globus sensation	100.00%	0.00%	0.00%	0.00%	0.00%
Dysphagia	97.60%	2.40%	0.00%	0.00%	0.00%
Impaired swallowing	97.60%	2.40%	0.00%	0.00%	0.00%
Choking	97.60%	2.40%	0.00%	0.00%	0.00%
Pain during swallow	100.00%	0.00%	0.00%	0.00%	0.00%
Altered esophageal transit time	100.00%	0.00%	0.00%	0.00%	0.00%
Eating problems NOS	100.00%	0.00%	0.00%	0.00%	0.00%
STOMACH SYMPTOMS	100.00%	0.00%	0.00%	0.00%	0.00%
Acid reflux/heartburn	100.00%	0.00%	0.00%	0.00%	0.00%
Early fullness (satiety)	100.00%	0.00%	0.00%	0.00%	0.00%
Abdominal pain	100.00%	0.00%	0.00%	0.00%	0.00%

Supplement D. Relationships between Freezing of Gait and other PD symptoms as identified in Symptom maps

Nausea & Vomiting	100.00%	0.00%	0.00%	0.00%	0.00%
Bloating/fullness	100.00%	0.00%	0.00%	0.00%	0.00%
Appetite changes	100.00%	0.00%	0.00%	0.00%	0.00%
BOWEL SYMPTOMS	100.00%	0.00%	0.00%	0.00%	0.00%
Constipation	100.00%	0.00%	0.00%	0.00%	0.00%
Tenesmus	100.00%	0.00%	0.00%	0.00%	0.00%
Straining during BM	100.00%	0.00%	0.00%	0.00%	0.00%
Problems with bowel emptying	100.00%	0.00%	0.00%	0.00%	0.00%
Bowel urgency	100.00%	0.00%	0.00%	0.00%	0.00%
Bowel incontinence	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired anal sphincter control	100.00%	0.00%	0.00%	0.00%	0.00%
Diarrhea	100.00%	0.00%	0.00%	0.00%	0.00%
General GI dysfunction	100.00%	0.00%	0.00%	0.00%	0.00%
Extra saliva in mouth	100.00%	0.00%	0.00%	0.00%	0.00%
Related to					
	Not related to FOG	"Freezing" but not FOG specific	Symptom Impacts FOG	FOG Impacts Symptom	Reciprocal Impact
URINARY DOMAIN					
URINARY DYSFUNCTION	92.70%	0.00%	0.00%	7.30%	0.00%
Urinary frequency	97.60%	0.00%	0.00%	2.40%	0.00%
Urinary urgency	97.60%	0.00%	0.00%	2.40%	0.00%
Nocturia	95.10%	0.00%	0.00%	4.90%	0.00%
Incomplete voiding	100.00%	0.00%	0.00%	0.00%	0.00%
Urinary incontinence	97.60%	0.00%	0.00%	2.40%	0.00%
Urinary infections	100.00%	0.00%	0.00%	0.00%	0.00%
Weak urine stream	100.00%	0.00%	0.00%	0.00%	0.00%
Related to					
	Not related to FOG	"Freezing" but not FOG specific	Symptom Impacts FOG	FOG Impacts Symptom	Reciprocal Impact
SEXUAL DOMAIN					
SEXUAL DYSFUNCTION	100.00%	0.00%	0.00%	0.00%	0.00%
Anorgasmia	100.00%	0.00%	0.00%	0.00%	0.00%
Ejaculatory dysfunction	100.00%	0.00%	0.00%	0.00%	0.00%
Erectile dysfunction (Male)	100.00%	0.00%	0.00%	0.00%	0.00%
Impaired libido	100.00%	0.00%	0.00%	0.00%	0.00%
Vaginal dryness (Female)	100.00%	0.00%	0.00%	0.00%	0.00%
Legs shake during sex	100.00%	0.00%	0.00%	0.00%	0.00%
Related to					
	Not related to FOG	"Freezing" but not FOG specific	Symptom Impacts FOG	FOG Impacts Symptom	Reciprocal Impact
AUTONOMIC & CV DOMAIN					
CARDIOVASCULAR SYMPTOMS	100.00%	0.00%	0.00%	0.00%	0.00%
Blood pressure regulation	100.00%	0.00%	0.00%	0.00%	0.00%
Hypotension	100.00%	0.00%	0.00%	0.00%	0.00%
Orthostatic hypotension	100.00%	0.00%	0.00%	0.00%	0.00%
Orthostatic symptoms	100.00%	0.00%	0.00%	0.00%	0.00%
Hypertension	100.00%	0.00%	0.00%	0.00%	0.00%
Supine hypertension	100.00%	0.00%	0.00%	0.00%	0.00%
Nocturnal hypertension	100.00%	0.00%	0.00%	0.00%	0.00%
Change in nocturnal BP	100.00%	0.00%	0.00%	0.00%	0.00%
Lower extremity swelling	100.00%	0.00%	0.00%	0.00%	0.00%
LIGHTHEADED, DIZZY, FAINTING	100.00%	0.00%	0.00%	0.00%	0.00%
Dizziness	100.00%	0.00%	0.00%	0.00%	0.00%
Lightheadedness	100.00%	0.00%	0.00%	0.00%	0.00%
Lightheadedness with long standing	100.00%	0.00%	0.00%	0.00%	0.00%
Fainting/Syncope	100.00%	0.00%	0.00%	0.00%	0.00%
SWEATING/HYPERHIDROSIS	100.00%	0.00%	0.00%	0.00%	0.00%
AUTONOMIC SYMPTOMS NOS	100.00%	0.00%	0.00%	0.00%	0.00%
Postural Hypertension	100.00%	0.00%	0.00%	0.00%	0.00%
Unsteady feeling (not specific lighthead or dizzy)	97.60%	0.00%	0.00%	2.40%	0.00%