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RECEIVED: ***02/12/2024*** *DATE APPROVED:* ***02/13/2024***

FILE NUMBER: ***#24-023***

APPLICATION FOR STATISTICAL CONSULTING

LAST NAME**:** Griffis FIRST NAME: Macy

DEPARTMENT (full name): Department of Speech, Language, and Hearing Sciences
CAMPUS MAILING ADDRESS: Lyles-Porter Hall

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YOUR PRIMARY POSITION AT PURDUE: Master's Student

Other:

(if a student) MAJOR PROFESSOR LAST NAME: Malandraki FIRST NAME: Georgia

PHONE NUMBER: 765-496-0206

MAJOR PROFESSOR CAMPUS ADDRESS (BLDG & DEPT): Department of Speech, Language, and Hearing Sciences / Lyles-Porter Hall

MAJOR PROFESSOR EMAIL: malandraki@purdue.edu

HOW DID YOU FIND US: Recommendation of my advisor or committee member

LIST STATISTICS COURSES TAKEN AND STATISTICAL COMPUTING EXPERIENCE: STAT 301 Elementary Statistical Methods (Purdue course)

STAGE OF RESEARCH: Presently collecting data

IF DESIGN STAGE IS COMPLETE, WAS A STATISTICIAN CONSULTED FOR DESIGN? Yes

PREVIOUS CONSULTANT – INSTITUTION/DEPARTMENT:

ESTIMATED NUMBER OF CONSULTING HOURS NEEDED THIS SEMESTER: 5 - 15 hours

EXPECTED COMPLETION DATE OF PROJECT: 8/1/2024

IMPORTANT DEADLINE OR DUE DATES RELATED TO YOUR PROJECT: Data collection: 05/2024, Data analysis: 08/2024, Write up and defending of thesis: 12/2024

THE RESULTS OF THIS RESEARCH WILL PROBABLY BE PUBLISHED AS:

M.S. Thesis

IS THIS RESEARCH SUPPORTED BY A GRANT OR CONTRACT? Yes

If so, give grant/contract title: Partially funded: Center for Aging and the Life Course Grant and Greulich Gift Fund (awarded to Dr Malandraki)

GIVE A BRIEF DESCRIPTION OF YOUR RESEARCH INCLUDING:

PURPOSE:

1) Identify and describe neuromuscular amplitude and timing components of typical swallows in patients with idiopathic Parkinson's disease.

2) Compare neuromuscular amplitude and timing components of rehabilitative swallowing maneuvers (Mendelsohn maneuver, effortful swallow, isometric tongue contraction) with typical swallows in patients with idiopathic Parkinson's disease.

DESCRIPTION OF VARIABLES TO BE MEASURED:

Data will be collected from a group of patients with idiopathic Parkinson's disease and dysphagia (n=15). The new wearable sEMG (surface electromyography) sensor system developed by the I-EaT lab (i-Phagia system) will be used to collect submental muscle activity.

Participants will perform two trials of five tasks: a) typical swallows (two consistencies, 5ml thin liquid, and 5cc pudding), b) swallows using a swallow maneuver (Mendelson maneuver), c) swallows using maximum effort (effortful swallow), and d) maximum isometric tongue press. Submental muscle activity will be measured during these four tasks .

Experimental factors:

Patient population (idiopathic Parkinson's)

Swallowing tasks (effortful swallow, Mendelsohn maneuver, tongue resistance, and typical swallows)

Outcome Variables

Surface EMG will be used to quantify muscle activity in the study. We will measure three outcome variables in the study: normalized mean sEMG amplitude, time to peak sEMG amplitude, and burst duration. The normalized mean sEMG amplitude is measured in % of maximum effort and indicates the level of muscle contraction and force. Time to peak sEMG amplitude is the duration from the onset of contraction to the time the peak amplitude value is reached (measured in seconds). This indicates how quickly a muscle reaches the maximal activation from the onset of the muscle activity. It is calculated by the duration between the onset of muscle activity and the peak amplitude value for each swallowing task. The burst duration is the total duration of the muscle contraction during an event (measured in seconds) detected on the EMG device.

RESEARCH QUESTIONS THAT YOU WANT TO ADDRESS USING STATISTICAL METHODS:

We want to compare the data from three outcome variables to see

1. What are the timing and amplitude components of normal swallows for PD patients' (just descriptive data)

2. Is there any difference in timing and amplitude components of the swallowing maneuvers compared to the typical swallows

STATISTICAL ISSUES:

To discuss what exact statistics methods should be used.

ADDITIONAL INFORMATION YOU THINK WOULD BE HELPFUL:

ATTACHMENTS:

No attachment