Pre-Screening Prodromal AD Trial Populations over the Telephone Using a Speech Biomarker for Cognition — Preliminary Results from AUTONOMY Phase 2 AD Trial Recruitment

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INTRODUCTION

Clinical trials in Alzheimer's Disease (AD) have shifted focus to earlier disease stages [1]. Consequently, recruitment strategies target a general population with the goal of identifying participants with mild cognitive impairment (MCI) and presenting AD pathophysiology, such as Tau positivity. Such classification is often unknown or undiagnosed, leading to high screen-fail rates, thus longer and more costly trials [2]. Cost-efficient and accurate pre-screening could significantly enhance screen-in rate and accelerate early AD trials. We present results from the pre-screening in AUTONOMY Phase 2 prodromal AD trial using a pre-screener based on the ki:elements (ki:e) speech biomarker for cognition (SB-C).

OBJECTIVES

This project will evaluate a remote, telephone-based speech biomarker for cognition which provides individualized recommendations to recruit into the clinical trial. This pre-screener will be measured to validate its sensitivity, specificity, and participant acceptance. The results will inform the utility of this speech biomarker as a cognitive measure in future AD trials.

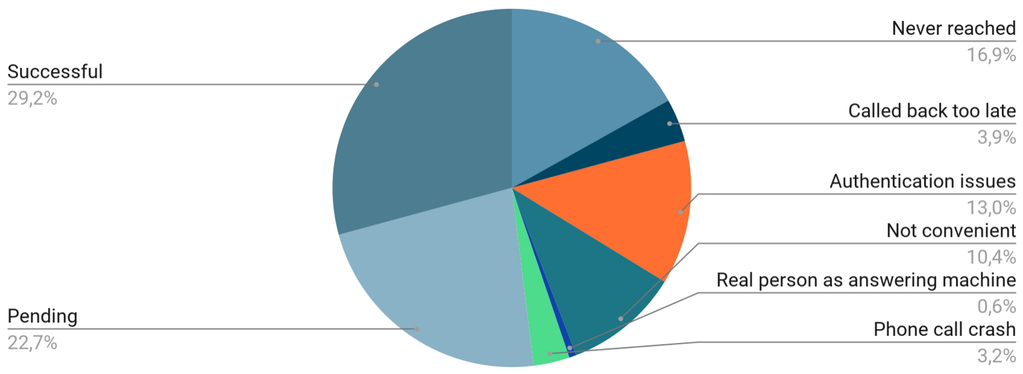

Fig. 2. Assessment statistics for non-completers

METHODS

Twenty clinical trial sites in the United States within the AUTONOMY Phase 2 prodromal AD trial (ClinicalTrials.gov: NCT04619420) were selected to pilot the remote pre-screener: the ki:e SB-C. It is integrated into a digital patient recruitment campaign, as illustrated by the funnel in figure 1. This pre-screener, which is optional for eligible participants and takes approximately 10 minutes to complete, leverages speech gathered during word list learning (Rey Auditory Verbal Learning Test), semantic verbal fluency, and free speech tasks. It leverages artificial intelligence to automatically extract up to 100 explainable speech features composing three subdomain scores for episodic memory, executive function, and processing speed plus an overall cognition score. After completing the call, responders are classified into referrals (potential MCI) and non-referrals (either healthy or dementia) based on a pre-screening engine that uses the SB-C and its subscores as input. Sites are blinded to the results of the pre-screener and participants are followed through the recruitment funnel to evaluate the accuracy and acceptability of the solution.

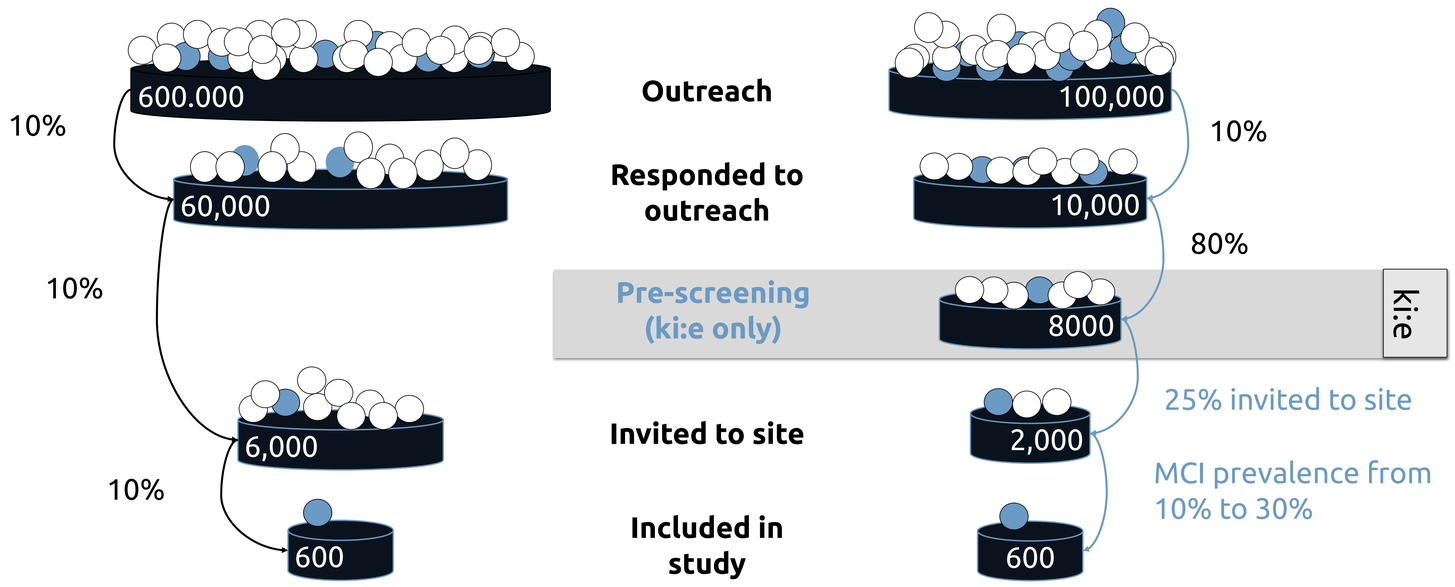

Fig. 1. Example calculation of optimization of enrollment using the ki:e remote SB-C.

RESULTS & DISCUSSION

Data collection is ongoing until May 2023. So far, 154 people opted in to take the pre-screener. Forty-five people completed the assessment, 35 are pending and 74 people did not complete the assessment (see Figure 2). Site-based screen results (e.g. Tau-PET scan) are not yet available.

Speech biomarkers present an opportunity to measure cognitive impairment in a highly scalable, low-cost fashion using readily-available technology. By effectively pre-screening participants in their own home, they avoid invasive site-based screeners while reducing site burden. The evidence-base continues to grow for speech-based assessments, paving way for accelerated clinical trials across neuroscience.

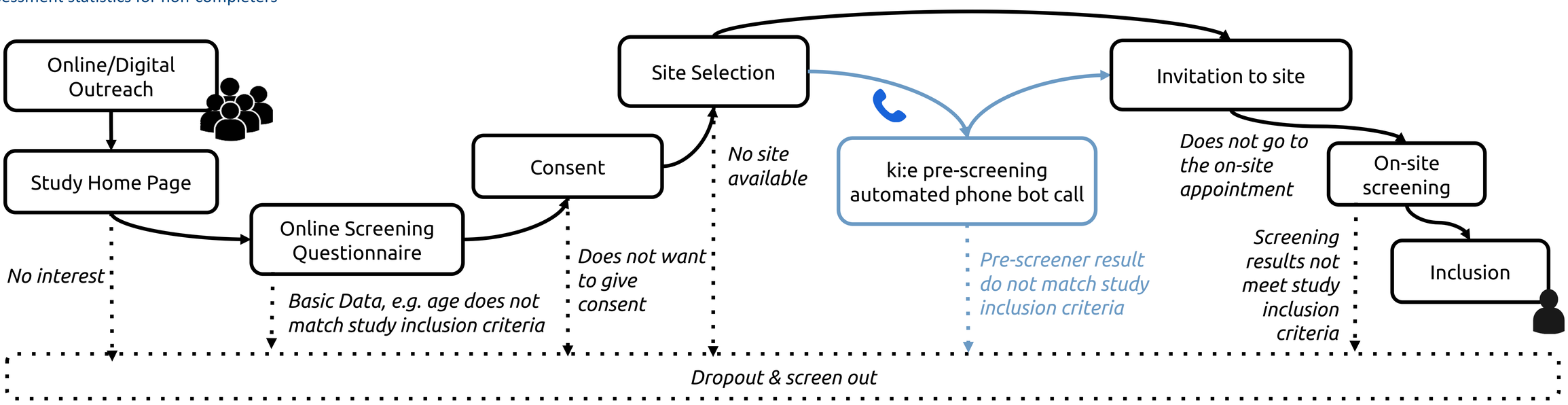

Fig. 3. Implementation of the ki:e SB-C into the study recruitment process.

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[2] Malzbender, K., Lavin-Mena, L., Hughes, L., Bose, N., Goldman, D., & Patel, D. (2020). Key Barriers for Clinical Trials for Alzheimer's Disease. White Papers - USC Schaeffer Center.