SPEECH-BASED TESTING IMPLEMENTATION IN EARLY INTERVENTION PSYCHOSIS SERVICES: A FEASIBILITY STUDY

AUTHORS

Julianna Olah, Raheem Chaudhry, Edwin Wong, Aeron Laffare, Armin Sinka, Omar Mena, Sarah Hopkins, Amanda Weber

AFFILIATIONS

Psyrin Inc.,
The Brookline Center for Community Mental Health,
CEDAR Clinic

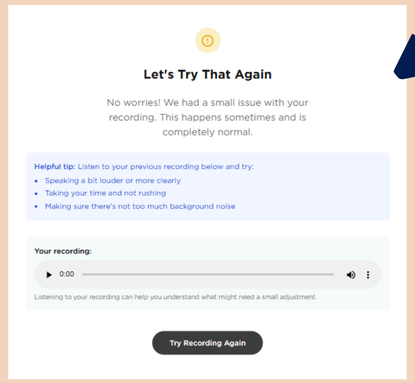
INTRODUCTION

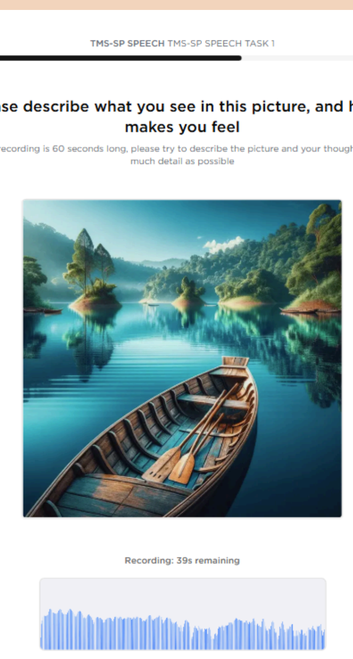
Early Intervention in Psychosis (EIP) services identify and treat individuals experiencing first-episode psychosis or at clinical risk of develping psychosis. This feasibility study assessed implementation of automated speech-based testing within an existing EIP service pathway, offering potential for objective, scalable screening and monitoring beyond traditional (questionnaires, interview) assessment methods.

OBJECTIVES

- Measuring adoption and acceptance among patients (N = 10)
- Integration of five-minute speech assessments into routine clinical appointments
- Training clinical staff in administering recordings (clinic or home)
- Deployment of machine learning algorithms for automated analysis
- Development of clinical reporting systems and decision support
- Understanding obstacles to broader clinician expansions

PATIENT INTERFACE





METHODOLOGY

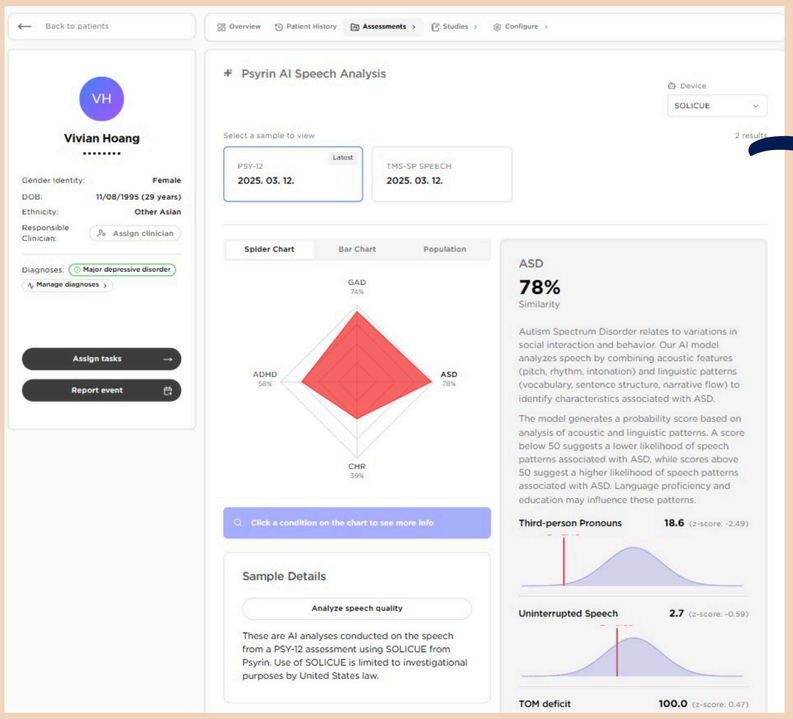
Assessment Approach

- 8-10 minute speech-based testing protocol
- Included structured and naturalistic speech tasks
- Implemented across site over 3-month period
- Monthly meetings and continous e-mail contact with clinicians to monitor implementation and gain qualitative insight

Outcome Measures

- Clinician feedback
- Patient engagement metrics
- Technical performance indicators
- Integration with existing clinical workflows

CLINICAL INTERFACE



RESULTS/FINDINGS

Technical Performance

- Consistent reliability with low inference latency (avg. 0.15 seconds)

Clinician Acceptance

- Clinicians do not trust that patient would do the test at home, so we could only test implementation of testing in clinic, during appointment
- 90% reported system was easy to use after training, however clinicians asked for help and go confused during actual deployment
- We had to modify authentication process (from password-protected to patient code and DOB) during implementation as patients failed to remember their password
- Clinicians struggled to interpret probability scores and speech markers
- Difficult to find time during appointment
- Believe that it increases quality of care but increases clinical burden (adds time to appointments)

Patient Engagement

- 70% completion rate (7/10)
- Most participants reported comfort with assessment process ('it is easy, you just have to talk')
- Consent procedure was complicated, especially if parental consent was also required ('too boring', 'too much text')
- Increased motivation to complete psychiatric assessment noted
- Excitement about 'AI involvement'
- Frustration about not-passed speech quality test

Diagnostic Performance

- Strong performance (<80% accuracy) across ADHD, ASD, Clinical high-risk and GAD , however, it is limited by small sample size (N = 10) and small ratio of positive cases

IMPROVEMENT POINTS

- adding Spanish language
- streamline log-in and authentication process
- simplifying clinician interface
- collect voice in an interactive, agentic structure, instead of task-based assessments
- increase clinical trust in 'at-home testing'
- add features to reduce clinician burden (e.g. generating note, collecting voice via conversation settings or intake)
- monitoring capabilities

POTENTIAL SOLUTION: PRE-ASSESSMENT AND INTAKE VOICE-AGENT TO COLLECT VOICE

CONCLUSION

Speech-based testing can be successfully implemented within EIP services with high acceptance from both clinicians and patients. However, interpretability of results and testing process should be improved to scalable solutions. For clinical adoption, solutions that simultaniusly conduct voice analysis and reduce clinical burden/engagement time should be developed and prioritised.