BACKGROUND

**Hispanic/Latinx population in Texas**
- Texas has the second largest Hispanic/Latinx population in the U.S (10,405,000).1
- 15% of the Hispanic/Latinx population are ≥ 65 years of age.2

**Spanish Neuropsychological Assessment**
- Availability of complete neuropsychological batteries in Spanish, including standardized administration instructions and accompanying normative data is sparse.3,4
- Research has shown that current clinical assessment practices with non-English speakers can include the use of institution-based translations, unstandardized administration instructions, and normative data sets that are not reflective of the individual’s socio-demographics, limiting the accuracy of diagnostic inferences.5

**CONSORTIUM FRAMEWORK**

**Clinical Practice**
- BCM Cerebro and UTHealth Neuropsychology Section founded CCACTUS in 2018. Faculty, psychologists, and post-doctoral fellows developed uniform cross-cultural clinical assessment practices, gathered published normative data for Spanish (monolingual and bilingual) and developed a repository.

**Cognitive Screeners**
- A core neuropsychological battery for the examination of neurodegenerative conditions (CCACTUS-Core) (Table 1) was developed based on known clinical utility, psychometric properties and available normative data sets that would generalize to the sociodemographic variables of the majority of Hispanic patients assessed at both sites.
- An abbreviated battery for those with significant cognitive decline (MMSE ≤ 12) was also developed (CCACTUS-Severe). This battery is composed of the following tests: MMSE, Baylor Profound Mental Status Exam, WAB Comprision Audittua Verbal (SINo), WAB Ordenes Secuenciales, and the RBANS-Spanish.
- Test selection guidelines for patients with low to no educational attainment were established.

**Research Applications**
- The consortium has identified a core research set of measures that will be used for future research studies.
- Translations and cultural modifications have been made to English measures which are being utilized clinically to examine psychometric properties and their clinical utility in comparison to current clinical practices.
- All administered measures have accompanying standardized administration instructions.
- Detailed sociodemographic information (e.g., SES, linguistic preference, country of origin) is being gathered to accurately characterize the sample.

**Table 1. CCACTUS-Core Battery**

<table>
<thead>
<tr>
<th>Executive Functioning</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonemic Fluency (FAS &amp; PPMR)</td>
<td>WMS-IV (Spain) Logical Memory I &amp; II</td>
</tr>
<tr>
<td>Color Trails 2 &amp; Trail Making Test B</td>
<td>WMS-IV (Spain) Visual Reproduction I &amp; II</td>
</tr>
<tr>
<td>CLOX 1</td>
<td>Hopkins Verbal Learning Test-Revised, Form 5</td>
</tr>
<tr>
<td>Stroop Color-Word - Interference Test</td>
<td>Rey Auditory Verbal Learning Task*</td>
</tr>
<tr>
<td>WAIS-IV (Mexico &amp; Spain) Similarities</td>
<td>Bateria Neuropsicologica en Español</td>
</tr>
<tr>
<td>Modified Wisconsin Card Scoring Test</td>
<td>Self-Report:</td>
</tr>
<tr>
<td>Language:</td>
<td>PHQ-9</td>
</tr>
<tr>
<td>Semantic Fluency (Animals, Fruits, &amp; Professions)</td>
<td>GAD-7</td>
</tr>
<tr>
<td>Naming (NAB Form 1 &amp; 2, Ponton-Satiz- BNT)</td>
<td>Health Literacy &amp; Acculturation Forms</td>
</tr>
<tr>
<td>WAIS-IV (Mexico &amp; Spain) Vocabulary</td>
<td>Back Depression Inventory-II*</td>
</tr>
<tr>
<td>Visual/Spatial Abilities:</td>
<td>Generic Depression Scale*</td>
</tr>
<tr>
<td>RBANS Line Orientation</td>
<td>Caregiver/Informant Questionnaire:</td>
</tr>
<tr>
<td>CLOX 2</td>
<td>ICCODE &amp; Zarit Caregiver Burden Scale</td>
</tr>
<tr>
<td>Rey-O Copy</td>
<td>Positive Aspects of Caregiving</td>
</tr>
<tr>
<td>WAIS-IV (Mexico &amp; Spain) Visual Puzzles</td>
<td>Neuropsychiatric Inventory Questionnaire</td>
</tr>
<tr>
<td>* optional</td>
<td>Activities of Daily Living Questionnaire – English</td>
</tr>
</tbody>
</table>

**NORMING PROCESS / REPOSITORY**

The CCACTUS scoring program compares existing normative data sets per patient for clinical/diagnostic purposes. Normative data sets used for comparison include: 5-10

- Wechsler Adult Intelligence 4th Edition, Spanish and Mexican versions
- Wechsler Memory Scales - 4th Edition, Spanish version
- Heaton-Caucasian and African American individuals in the United States
- "Arango" sets from Argentina, Bolivia, Chile, Colombia, Cuba, El Salvador, Guatemala, Honduras, Mexico, Paraguay, Peru, and Puerto Rico.
- Project Frontier - Texas Mexican Americans

**CASE ILLUSTRATION**

- The following case provides an example of the discrepancies found in clinical classifications across normative data sources and the need to use data sets that generalize to the sociodemographics of the individual being evaluated (see Figure 2).
- Hispanic female with six years of education. Medical history includes hypertension, Parkinson’s disease, and symptoms of depression and anxiety. MMSE reported by neurololgist: 22/30.
- Self-report measures of emotional distress revealed a possible level of depression and a minimal level of worry.
- Family reported an elevated level of neurobehavioral symptoms.
- Family reported declines in telephone use, transportation, and finance and medication management.
- Given these findings, clinicians are urged to consider the impact of sociodemographic variables, collateral reports, clinical classifications across available normative data sets, and base rates in conjunction with medical data to bolster diagnostic impressions.

**FUTURE DIRECTIONS**

- Translations for all clinical documents into Spanish.
- Expansion of collected sociodemographic data to enhance interpretation of results.
- Finalization of consortium structure/system steering committee
- CCACTUS invitation to neighboring institutions with the clinical objective to increase availability of uniform services to the Hispanic and Spanish speaking population of Texas.
- Development of data sets for clinical research (e.g. normative data sets and neurocognitive profiles) for participating clinical providers and researchers.
- Development of research protocols including a study to examine caregiver profiles (possible burden and positive aspects of caregiving) in an effort to better serve the families of our Hispanic/Latinx community.
- Health literacy assessment - results will be used to tailor Spanish educational materials.

**REFERENCES**