ADLs = basic self care tasks (eg, dressing, feeding, transfers, mobility, toileting)

IADLs = Higher-level tasks that require coordination of skills (eg, housework, managing finances, shopping, using communication devices, transportation, care of pets/others, health management, meal preparation)

IADLs are necessary for independent living and a breakdown in IADLs may be first sign of dementia

Enhanced understanding of impact of cognitive impairment on daily fx

Literature suggests relationships between IADL measures and behavior/ability

IADL dysfunction may predict:
  - Dementia
  - Institutionalization
  - Death

How best to measure IADLs?
IADL Assessment Challenges

- How to assess
- What to assess
- Neuropsych & practical relevance
- How to select / construct items
- Scoring & psychometric issues
- Breadth vs depth vs time to administer within the context of neuropsych eval

Factors to Consider in Selecting IADL Measures

- Rating scale vs performance-based
- Target population
- Purpose of examination (dx, rx, placement, feedback; clinical / research)
- Psychometric properties (norms, etc)
- Ease of administration/scoring
- Portability
- Administration time

Common IADL Rating Scales

- Lawton & Brody IADL Scale (1969)
- Functional Activities Questionnaire (FAQ; 1982)
- Disability Assessment for Dementia (1999)
- Alzheimer Disease Cooperative Study (ADCS) Activities of Daily Living Inventory (1997)
- Everyday Cognition (Ecog; 2008)
IADL Assessment Challenges

- Ratings vs performance-based tasks
- Potential issues with rating scales
  - Raters (self or other) may be unaware
  - Lack of familiarity with pt’s abilities
  - Potential rating bias (+ or -)
  - Potential influence of mood/situational effects
- How to validly measure without adding much time to evaluations?
  - Ratings may lack objectivity

Performance-based IADL Measures

- Direct observation/rating of behaviors
  - (e.g. see Schmitter-Edgecombe et al., 2011)
- Questions involving everyday problems
  - Everyday Problems Test (Willis & Marsiske, 1993)
- Behavioral simulation tasks

Performance-based IADL Simulation Measures

- Direct Assessment of Functional Status (DAFS; Loewenstein et al., 1989)
- Independent Living Scales (ILS; Loeb, 1996)
- UCSD Performance-based Skills Assessment (UPSA; Patterson et al., 2001; Gomar et al., 2011)
- Texas Functional Living Scale (TFLS; Cullum, Saine & Weiner, 2009) (formerly the Test of Everyday Functional Abilities (TEFA))
### Independent Living Scales (ILS; Loeb, 1986)
- Widely used; 68 items, **Five domains**:
  - Memory/Orientation
  - Managing Money
  - Managing Home and Transportation
  - Health and Safety
  - Social Adjustment
- Administration time: 45 minutes (+10 min. scoring)

### UPSA (Patterson et al., 2001)
- Developed in psychiatric populations
- **Five Domains**:
  - Household Chores
  - Communication
  - Finance
  - Transportation
  - Planning Recreational Activities
- Administration time: 45 minutes (+10 to 15 min. scoring)

### TFLS (Cullum, Saine & Weiner, 2009)
- Developed for use in dementia
- **Four domains**:
  - Time
  - Money/Calculation
  - Communication
  - Memory
- Administration time: 15-20 minutes (+5 min. scoring)
**Comparison of Three Performance-based IADL Measures**

- ILS - Long history, widely used
- UPSA - More recent, developed in psychiatric populations but recently applied to MCI and dementia
- TFLS - Designed for dementia, with brevity and cognitive loading in mind

**TFLS Development**

- Reviewed literature on performance-based and other-rated IADL measures
- Identified types of tasks that met TFLS development criteria
- Sought simple items with face validity while avoiding ceiling effects
- Piloted various tasks in pts with dementia

**TFLS Development Goals**

- Performance-based
- Cognitively-oriented
- Useful in dementia
- Good psychometric properties
- Portable
- Easy to administer
- BRIEF
TFLS Development

- Adjunct with neuropsych evaluation
- Supplement dx information, clarify NP
- Treatment planning
- Providing feedback to pts & families
- Charting disease progression
- Response to treatment

TFLS Development

- Selected by Pearson as a brief IADL measure for WAIS4/WMS4 standardization
- N = 800 stratified based on U.S. census
- Clinical sample of 212 mixed Ss
  - Assisted living, Caregiver-supported, AD, Intellectual disability (mild & moderate), TBI, Schiz, Depression, Autism

TFLS Scores

- Cumulative percentages for subscales
  - Skewed due to nature of items, so could not use scaled scores.
- Overall total T-score
  - 50 total raw score points possible
TFLS Subtests & Sample Tasks

- **Time**
  - Calendar use:
    - Identifying day of week
    - Finding dates
    - Clock drawing
    - Time reading

Subtotal = 9 point maximum

- **Money & Calculation**
  - Adding money (2q, 2d, 3n; 4q, 2n, 3p)
  - Figuring money (take $1.73 out of bag)
  - Making change

Subtotal = 8 point maximum
TFLS Subtests & Sample Tasks

- **Communication**
  - Water bill / check writing / envelope address
  - Phone book lookup #, drug store, dial #, 911
  - Sandwich making steps
  - Recipe reading / microwave setting

Subtotal = 28 point maximum

- **Memory**
  - Taking candy out of bottle when timer rings
  - Without or with prompts
  - Recall of check written (to whom)
  - Recall amount of check

Subtotal = 5 point maximum

---

TCP
Greater Springfield Residence & Business Pages
TCP Task

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TFLS Microwave setting / meal preparation subtest

TFLS: Development

Performance-Based Instrument to Assess Functional Capacity in Dementia: The Texas Functional Living Scale

WC. Moore, Colvin, Ph.D., *Kathy Stine, Ph.D., *Laurna D. Chai, M.S.,
*Kris Winne-Cook, M.S., & Kevin F. Grey, M.D., and *Myren F. Weiner, M.D.

*The University of Texas Southwestern Medical Center at Dallas, and the Department of Veterans Affairs, North Texas Health Care System at Dallas, Dallas, Texas
TILS: Initial Validity

- Discriminated AD (MM=20) from control
- Unrelated to age, but r = .5 with educ
- Good test-retest reliability @ 1mo., r = .93
- Subscales r with total, most > .9
- Corr. with BDRS = .4
- Corr. with CERAD Beh Rtg Scale = .05
- Total score correlated with MMSE

TILS – MMSE Correlation


TILS Correlations with ILS (Loeb, 1994)

- ILS Total
  - ILS mem/orientation
  - ILS Money
  - ILS Home/transport.
  - ILS Health/safety

TFLS in Residential Care

A Direct Functional Measure to Help Ascertain Optimal Level of Residential Care

Myrna F. Weiner, MD, Barbara Davis, MA, Katrina Martin-Cook, MS, Linda S. Hossen, PhD, Kathleen C. Scira, PhD, and C.amento Cullum, PhD

A brief direct measure of daily living skills might help place cognitively impaired clients in suitable living arrangements. In this study, the Test of Everyday Functional Skills (TFLS) was a possible outcome measure with some support. The authors recruited 77 cognitively impaired persons in independent living (H), N = 26; assisted living (A), N = 21; and dementia special care (C), N = 26, units. Participants in H, A, and C were administered the TFLS, and other instruments, at baseline and every six months over 18 months and often transferred to a higher level of care. Special care residents were administered the same instruments only at baseline. The TFLS data allowed H, A, and C, to show significant functional competence for H, and a score of <0.001 indicates functional competence for A, with no significant change observed in C. A total of 31 residents deemed to be capable persons.

Keywords: Test of Everyday Functional Skills, assisted living, dementia special care

TFLS Annualized Change in Mild AD

<table>
<thead>
<tr>
<th>Measure</th>
<th>AD</th>
<th>NC</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMSE 1</td>
<td>29.6</td>
<td>29.4</td>
<td></td>
</tr>
<tr>
<td>MMSE 2</td>
<td>23.4</td>
<td>29.2</td>
<td></td>
</tr>
<tr>
<td>Ann. Chg.</td>
<td>1.7</td>
<td>0.2</td>
<td>5.7%</td>
</tr>
<tr>
<td>TFLS 1</td>
<td>38.2</td>
<td>48.3</td>
<td></td>
</tr>
<tr>
<td>TFLS 2</td>
<td>34.7</td>
<td>49.0</td>
<td></td>
</tr>
<tr>
<td>Ann. Chg.</td>
<td>3.1</td>
<td>-0.6</td>
<td>8.5%</td>
</tr>
</tbody>
</table>

Weiner, Fields, Hynan & Cullum, 2008

TFLS in MCI

<table>
<thead>
<tr>
<th>Measure</th>
<th>MCI</th>
<th>NC</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFLS Total</td>
<td>47.17</td>
<td>48.77</td>
<td>.023</td>
</tr>
<tr>
<td>Dressing</td>
<td>4.97</td>
<td>5.00</td>
<td>N/A</td>
</tr>
<tr>
<td>Time/Orient</td>
<td>14.73</td>
<td>14.63</td>
<td>.661</td>
</tr>
<tr>
<td>Memory</td>
<td>11.10</td>
<td>12.17</td>
<td>.779</td>
</tr>
<tr>
<td>Communic.</td>
<td>11.10</td>
<td>11.37</td>
<td>.269</td>
</tr>
<tr>
<td>Memory</td>
<td>27.30</td>
<td>29.21</td>
<td>.002</td>
</tr>
</tbody>
</table>

Binegar, Hynan, Lacritz, Weiner & Cullum, 2009
**TFLS Psychometric Properties**

- Split-half reliability - NC: \(0.65^* - 0.80\) \(x = 0.75\)
- Split-half - clinical: \(0.63^* - 0.97\) \(x = 0.92\)
- Test-retest: \(0.66\) NC, \(0.90\) clin.
- S.E.M.: \(3.75 - 5.49\) \(x = 4.46\)

**TFLS Test-Reetest Reliability**

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total T-score</td>
<td>50.7</td>
<td>53.5</td>
</tr>
<tr>
<td>Time</td>
<td>8.0</td>
<td>8.3</td>
</tr>
<tr>
<td>Money/Calculation</td>
<td>7.4</td>
<td>7.5</td>
</tr>
<tr>
<td>Communication</td>
<td>25.9</td>
<td>26.2</td>
</tr>
<tr>
<td>Memory</td>
<td>4.6</td>
<td>4.8</td>
</tr>
</tbody>
</table>

\(N = 229\); mean test-retest = 23 days; Cullum, Weiner & Saine, 2009

**TFLS Correlations: WAIS-4**

- Verbal Comp. Index: 0.74
- Perceptual Reasoning Index: 0.71
- Working Memory Index: 0.74
- Processing Speed Index: 0.71
- Global Ability Index: 0.77
- Full Scale IQ: 0.79
TFLS Correlations: WMS-4

Auditory Memory Index .67
Visual Memory Index .70
Visual Working Memory .80
Immediate Memory .71
Delayed Memory .71

TFLS Total Scores x Clinical Grp.

Dementia - assisted living 32.1
Dementia - caregiver help 42.2
Mild Intellectual Disability 28.6
Mod. Intellectual Disability 22.5
Schizophrenia 43.5
Mild Traumatic Brain Injury 51.2

TFLS Research Summary

• Evidence of:
  • Validity
  • Reliability

• Clinical utility
  • Detects dysfunction in dementia
  • Distinguishes groups x level of care needed
  • Treatment Response
  • Changes over time
Clinical Applications... 1

- Direct/indirect requests
- Diagnosis
- Capacity/competence
- Treatment factors
- Placement issues
- Support/assistance
- Environmental structuring
- Baseline & life planning

Clinical Applications... 2

- No informant(s)
- Patient denial/unawareness
- Discrepant findings:
  - Cognitive results vs. report of functional status
  - Patient vs. family or other report
  - Facilitate access to resources

Mean TFLS Performances of Special Groups

- Dementia-assisted living 32.1
- Dementia-caregiver help 42.2
- Probable AD 32.0
- Mild Intellectual Disability 28.6
- Mod. Intellectual Disability 22.5
Case #1: “I am too young for Alzheimer’s disease” (AD)

- 53 y/o practicing attorney
- Missed recent court appearances
- Urged by friends to see neurologist
- Referred for assistance with diagnosis
- “Is it the pot? I’m too young for AD”
- Neurocognitive findings c/w AD
- TFLS = 37
- Correlations with daily activities
- Feedback & recommendations to patient, friends and referring neurologist

Case #1: Orientation to time

Case #1: Calculating elapsed time
Case #1: Setting time

Case #1: “What’s the alarm for?”

Case #2: “I only shake”

- 67 y/o RH retired electrical engineer
- 12 year history of Parkinson’s disease (PD)
- R-sided tremor & stiffness w/ recent falls
- Struck head in recent fall (?TBI)
- Referral: PD vs TBI vs Depression?
- Neurocognitive findings c/w PD
- TFLS = 38
- Feedback & recommendations to patient, family & neurologist
Case #2: How much money is this?

Case #2: Utility bill

Case #2: Check for utility bill
Case #2: Microwaving food

- 64 y/o artist homemaker on vacation
- Husband fractured hip...surgery...rehab
- Patient angry, demanding at rehab
- PCP diagnosed w/ AD
- Additional stressors
- Placed in nursing home
- Son pursuing guardianship

Case #3: "My husband fell and they put me away"

- 64 y/o artist homemaker on vacation
- Husband fractured hip...surgery...rehab
- Patient angry, demanding at rehab
- PCP diagnosed w/ AD
- Additional stressors
- Placed in nursing home
- Son pursuing guardianship

Case #3 cont....

- Friend took patient to neurologist
- Referral: diagnosis, treatment, functional needs
- Initial evaluation
- Follow-up evaluation with TFLS = 42
- Feedback & recommendations to referring physician, patient, advocate, son, and social worker.....
Case #4: "Something's Wrong – I am not very smart"

- 50 y/o male with anoxic injury
- Hx of Borderline IQ & special education
- Lives with Mom in small town
- Works part-time bussing tables
- Recently getting lost, refusing chores....
- PCP: diagnosis, treatment; placement?
- NP results: IQ 65; profound memory deficits
- TFLS = 25
- Feedback & Recommendations to PCP, Mom and Patient

Case #4: Time Setting

Summary

- Utility of functional assessment
- Questions?
TFLS: Future Directions

- Examination in various dementia types and other neurobehavioral disorders
- Comparison with other neuropsychological measures
- Identification of most important items
- Predicting everyday behaviors
- Employing new statistical techniques & data (e.g. percentile norms for subtests)

TFLS References


