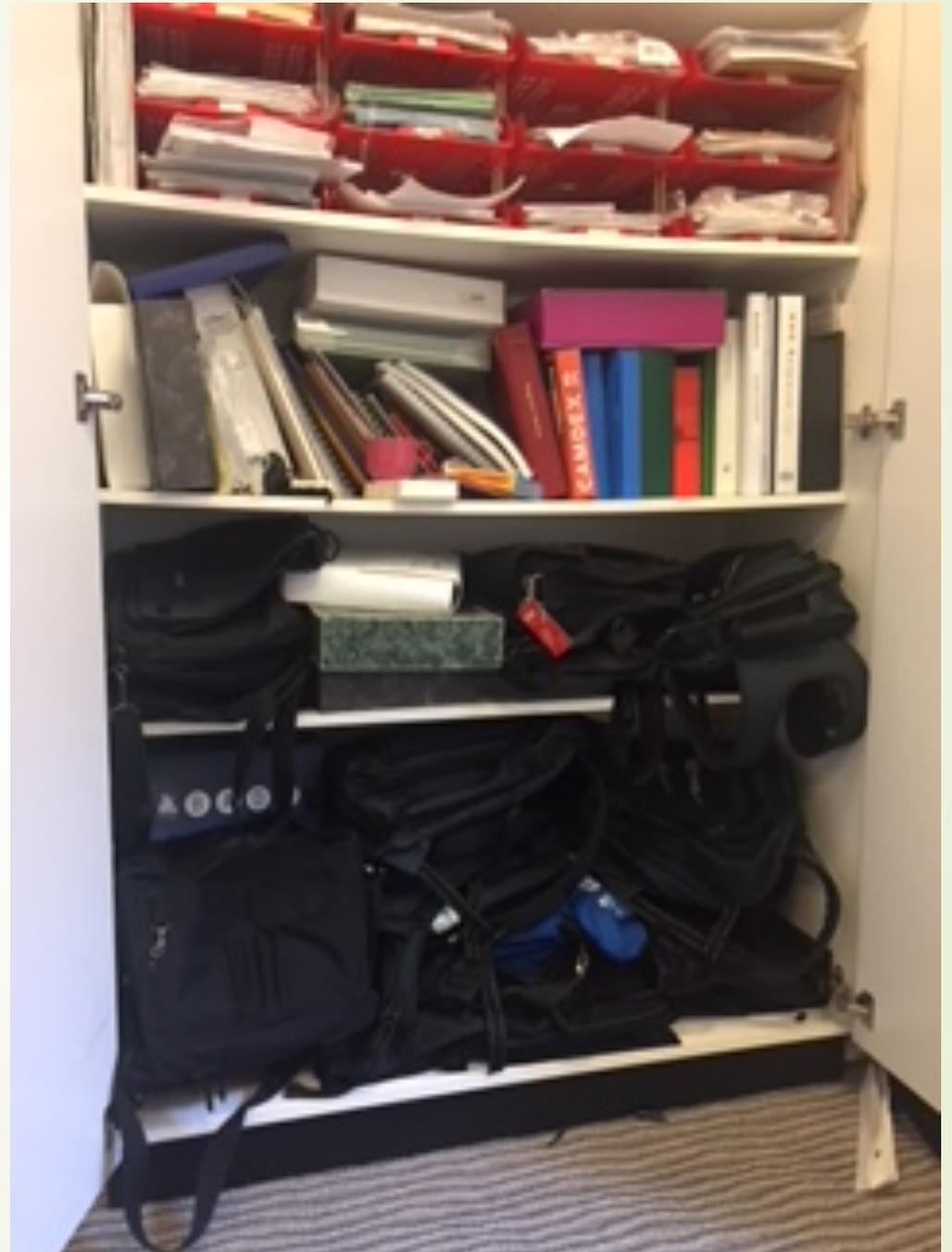# Test selection

Process of a neuropsychological assessment

Gather information
- Review of information provided by referrer and if possible review of medical records
- Interview with client and his/her relative or carer

Test selection
- Purpose of assessment?
- Screening test?
- **Which measure is appropriate for my client?**
- Fixed vs flexible battery

Test administration and scoring
- Awareness of standardisation procedures
- Awareness of scoring principles

What do you need to consider when selecting a test?

- Practical considerations
  - How long will it take to administer?
    - What is the time available to assess? What is the patient's tolerance for testing?
  - Do I have access to the test I want to use?
- Is it sensitive enough to detect my client's problems
- Are there problems which make it practically difficult to administer the test? (e.g., sensory and motor problems)
- Has testing been completed previously?
- Are parallel forms available to allow comparison of performance over time?
- Am I qualified to use the test?

Balance between undertaking an adequate assessment and over assessing.

Cognitive Screening Tests

- **Potential uses**
- Early identification of individuals at potential risk for condition or disorder
- May indicate need for further evaluation or intervention
- May be used to monitor progression of symptoms or response to intervention
- Does not provide definitive diagnoses
  - **Administration**
- May be administered as part of routine clinical visit
- Generally brief (<30 min)
- Requires minimal training for administrator or can be self-administered
  - **Domains assessed**
- Narrower in scope

Comprehensive Neuropsychological Batteries

- **Potential uses**
- Determination of presence and magnitude of impairment
- Determination of diagnoses
- Determination of functional status, abilities, and capacities
- Assistance with rehabilitation planning
- **Administration**
- Varies but typically several hours
- Typically occurs as a separate encounter or appointment
- Requires specialized training in administration and interpretation
- **Domains assessed**
- Multidimensional
- Provides information about functioning across multiple domains

Does the test measure what I want it to?

Attention/ Orientation

- mporal/spatial orientation
- git span
- ced Auditory Serial Addition t (PASAT)
- op Test/ Colour Word erference (DKEFS)
- il Making Tests
- ding (WAIS)/ Digit Symbols dality test
- t of Everyday Attention A)

Perceptual

- Visual Inattention tests (i.e. Line Cancellation/ Balloons/ Behavioural Inattention test)
- Judgement of Line Orientation
- Test of Facial Recognition
- Visual Object and Space Perception Battery (VOSP)
- Hooper Visual Organisation Tests

Memory

- California Verbal Learning test (C II)
- Selective Reminding/Cued Cate Recall
- Complex Figure
- Cambridge Prospective Memor
- Autobiographical memory Inter
- Wechsler Memory Scale (WMS)
- Doors and People
- BIRT Memory and Information Processing Battery (BMIPB)
- Camden Memory tests
- Rivermead Behavioural Memory Scale

es the test measure what I want it to?

Verbal functions and language skills	Construction and motor control	Concept formatio reasoning and execu skills
•Western Aphasia Battery •Token Test •Boston Naming Test •Graded Naming Test •Vocabulary (WAIS) •Peabody Picture Vocabulary Test •Verbal fluency (letter, category, action) •Speed of writing •Information	•Drawing/copying •Complex figure Test •Clock drawing •Block design •Finger Tapping test •Grooved Pegboard	•Similarities (WAIS) •Hayling and Brixton (Spatial Anticipation) Tests •Twenty Questions/Proverbs (•Matrices •Wisconsin card Sorting Test (•Comprehension •Arithmetic (WAIS) •Tower test (DKEFS)/Lower of London •Behavioural Assessment of th Dysexecutive Syndrome (BA •Delis-Kaplan Executive Func Systems (DKEFS)

Test selection-psychometric considerations

- All neuropsychological tests are imperfect and contain various sources of measureme error.

- Psychometric tests vary in the rigour with which they have been developed.

- Therefore in choosing which test to use with a given client, you need to think about whether the test is appropriate for this client on this occasion.

- An understanding of the psychometric properties of tests, normative samples, and test scores is an essential foundation for meaningful and accurate clinical interpretations

- We need to know how to distinguish good tools from poor ones

You need to consider:

- Is the psychometric test **valid**? (the degree to which evidence and theory support the interpretations and relevance of test score in the proposed use of the test)

- Is it **reliable**?(that is, the consistency of measurements obtained on a test when the testing procedure is repeated on a population of individuals or groups)

- Is it **sensitive**?(able to differentiate with regard to the attributes of interest)

- What is the likely **error of measurement**? (how confident can we be that the test outcome is a result of client ability or whether it is due to systematic error (i.e. anxiety, administration error, measurement error)

What factors of a psychometric test do we need to consider?

Normative data: The representative sample against which to compare an individual's performance. We need to know if the test has an adequate normative sample for the purposes to which it may be used and what are the limitations of this sample?

- Sample size?

- Sample characteristics (UK norms? Age, Education, Socio-economic status, ethnicity etc.)

- Any information about clinical samples (i.e. dementia, acquired brain injury)

- Any limitations of generalisability attributable to normative sample composition or testing circumstances must be taken into consideration when standardised scores are interpreted.

Factors affecting reliability (the consistency of measurement of a given score)

- Test characteristics (length, item type)

- Sample characteristics (sample size, range, variability)

- Test's 'clarity' is intimately related to reliability
  - Clearly written items
  - Easily understood instructions
  - Standardised administration conditions
  - Explicit scoring rules that minimise subjectivity
  - Process for training raters to a performance criterion

Checklist for reliability

- Does the test's manual have a section on reliability?

- Is more than one type of reliability coefficient given?

- Does the test have parallel forms?

- What type of reliability are you more concerned with for your partic
situation? (internal, test-retests, alternate form, interrater)

- Are confidence intervals given? If not is the standard deviation of th
test given so that you can calculate them from reliability coefficien

- Find the highest and lowest reliability coefficients in the manual. Are
you satisfied with this range.

- Is there an equivalent test that has better reliability coefficients?

Reliability coefficients

- High reliability coefficients preferable, but there may be some circumstances where lower coefficients may be acceptable (i.e. executive functions)

- Low internal consistency may mean a test is made up of items that do not measure the same construct, or it could mean that the test is designed to measure a broad set of heterogeneous domains (e.g. dementia screening)

- Low test-retest stability may mean that a test is poorly designed and unstable over time, or it could mean that th trait being measure is changeable and dynamic (e.g. depression)

Validity – degree to which a test actually measures what it is intended to measure

- **Construct validity**: Whether a scale measures or correlates with the theorized psychological construct. This includes:

  - Convergent validity - The ability of a measurement scale to correlate (or converge) with other measures of the same variable

  - Divergent validity - the results obtained by this instrument do not correlate too strongly with measurements of a similar but distinct trait

- **Content validity** (is it based on a theoretical model, is there supporting evidence, is the construct well defined, does the test have a large enough sample of items to be representative of domain, was final item pool evaluated by experts for accuracy and relevance)

- **Criterion validity** (concurrent and predictive): how well one measure predicts outcome for another, i.e. how it predicts performance in another situation, either at the same time or a later time.

- **Ecological validity**: The effectiveness of a test in predicting performance in real-world settings.

Factors in Test Selection for People with Learning Disabilities

- Limited literature: What exists is often interesting but not clinically applicable. i.e. object assembly.
- Lack of confidence-ours and client's. Tests can be a lot like school especially parts of the WAIS IV.
- Does it make sense to test?
- Time- can take longer
- Lack of suitable tests:
  - Complex instructions
  - Floor effects

Factors in Test Selection for People with Learning Disabilities

- Lack of normative data

- More factors that influence performance (e.g. physical, communication difficulties)

- Harder to screen for factors influencing performance (e.g. HADS and LD)

- Gaining consent and MCA. Easy read information

Further reading

Crawford, J. R. (2003). Psychometric foundations of neuropsychological assessment. In L. H. Goldstein & J. McNeil (Eds.), Clinical Neuropsychology: A Practical Guide to Assessment and Management for Clinicians. Chichester: Wiley

You can get this article online at:
http://homepages.abdn.ac.uk/j.crawford/dept/pdfs/Chapters/Chapter_Psychometric_foundations.pdf

- Lichtenberger & Kaufman (2009) Essentials of WAIS-IV Assessment
- Weiss et al (2010) WAIS-IV: Clinical Use and Interpretation
- Johnson, B. & Hagger-Johnson, G. (2013) Psychometric Assessment, Statistics and Report Writing. Pearson.