Part 1

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General Introduction: What Is the Relevance of Neuropsychology for Clinical Psychology Practice?
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Why Study Clinical Neuropsychology?

At this early stage in the 21st century, clinical neuropsychology is rightly finding its feet as a well-delineated and expanding clinical specialty within clinical psychology. It has moved away from the purely diagnostic role it acquired after the Second World War, to one in which the characterization of a person’s functional strengths and weaknesses, and the explanation of their behaviour have become central in extending the range of meaningful questions that can be posed about an individual patient’s presentation. The history of neuropsychology, and its development into a clinical specialty, has depended heavily on theoretical innovation and the constant need to develop a rigorous evidence base (Marshall and Gurd, 2010). Clinical neuropsychology is now very much valued as not simply involving the assessment of cognitive abilities in patients with cerebral pathology, but also as playing a major role in the rehabilitation of such people. It is also contributing to the understanding of the impact on cognitive functioning of disorders hitherto conceptualized as psychiatric or functional (rather than organic), for example depression or schizophrenia, and is being used to understand and hence possibly conceptualise in neuropsychological terms a variety of antisocial or maladaptive behaviours. Neuropsychology has expanded its area of enquiry beyond the testing room, and into the implications of cognitive impairment for everyday life, with a range of tests that are striving to be more ecologically valid (e.g., Wilson et al., 1996) as well as environmentally based (Shallice and Burgess, 1991; Alderman et al., 2003).

It is therefore important that all clinical psychologists, and not just those working in specialist neuropsychological settings, have a basic grounding in neuropsychology.
Perhaps the simplest way of illustrating the widespread application of neuropsychological skills comes from the types of questions that clinical psychologists might need to answer about their patients. Thus, a clinical psychologist working in a primary-care setting, being the first person to undertake a formal assessment of a patient, might need to determine whether their patient’s complaint of poor memory represents a condition that merits referral for further investigation by a neurologist or is likely to represent the consequences of anxiety or depression. In an adult mental-health setting, just as in a neuropsychiatry service, there may be the need to decide whether a newly developed memory disorder is psychogenically determined, perhaps even characteristic of factitious disorder or malingering. A clinical psychologist working with people with learning disabilities might need to be able to assess whether their patient’s cognitive profile is indeed characteristic of a particular disorder (e.g., Down’s Syndrome), or whether it represents the likely onset of the dementia that is often found in older adults with Down’s Syndrome or points to the impact of some additional, acquired neuropathology (e.g., a recent head injury). In a forensic setting, the question for the clinical psychologist to address may well take the form of whether the person’s offending behaviour could be accounted for by a previous head injury leading to impulsive behaviour characteristic of executive dysfunction. Working with older adults, the clinical psychologist may not only be trying to clarify whether the person’s cognitive decline is representative of dementia rather than affective disorder but also may need to detail the precise nature of any dementia (e.g., Alzheimer’s disease or fronto-temporal dementia). In an alcohol-abuse service, the evaluation of a person’s memory and executive dysfunction may have implications for their future treatment or placement. In child-psychology settings, the need may well be to clarify the impact of developmental as well as acquired neuropathology on educational and social development.

In all of these settings, a good grounding in the principles of neuropsychological assessment and test interpretation (see Chapter 6) will contribute to the delivery of an effective and professional service. This grounding may also, given service constraints, permit the formulation of appropriate interventions designed to ameliorate the cognitive difficulties delineated by means of the assessment, as well as through observations of the patient’s everyday behaviour. In all such instances, the clinical psychologist should be seeking to act as a scientist-practitioner, using the ever-growing neuropsychological literature on which to base hypotheses for their assessment and gathering information from as wide a range of sources as possible. As Walsh and Darby (1999) indicate, the clinical (neuro)psychologist may be setting out to confirm that certain features of the patient’s presentation are consistent with a particular disorder or syndrome, to generate and then test their own hypotheses about the nature of the patient’s deficits, or to decide between competing hypotheses about the person’s deficits and their causes, often in a medicolegal setting of either a criminal or civil nature.

One of the main reasons why the clinical neuropsychologist’s role has moved away from a strictly diagnostic one is the dramatic development in neuroimaging
techniques that now offer markedly improved options for identifying structural and functional cerebral abnormalities (see Chapter 3). This has left clinical neuropsychologists free to develop a better understanding of the nature of different disorders and their neuropathological correlates. One example of this development is the careful study of different types of dementia, whereby distinctions have been made between Alzheimer’s disease, vascular dementias and frontotemporal dementias (and their variants – see Chapter 15), based both on formal neuropsychological test batteries and on behavioural rating scales (e.g., Bathgate et al., 2001; Grace and Malloy, 2001; Kertesz et al., 2000; Snowden et al., 2001) as well as between dementias related to other neurodegenerative diseases (e.g., Snowden, 2010). There is now also a much better understanding of how to assess psychogenically determined as opposed to organic memory impairment (see, for example, Chapter 7), which has implications both for interventions and for medicolegal work, an area where clinical neuropsychologists can assume a very high profile (see Chapter 17).

It is inevitable that clinicians will develop differing approaches to the assessment and documentation of (and also interventions to deal with) their patients’ cognitive impairments. This will arise through differing training experiences and both pre- and postqualification clinical service constraints. Below, however, we will outline some of the principles we consider to be essential to the development of personal competence in the delivery of a service that is able to answer neuropsychological questions about patients. We will be focussing in large part on the assessment and interpretation of neuropsychological impairment.

**Common Issues Across Different Assessments**

Irrespective of the specific referral, there are certain types of information that must be collected prior to the assessment in order for the clinical psychologist to maximise their opportunity for collecting meaningful data. Here, we will expand on, and add to, some of the very helpful suggestions made by Powell and Wilson (1994), echoed also by Evans (2010). Thus, information should be collected on:

- **the intended purpose of investigation**: it is important to clarify with the referrer what information is being sought from an assessment, and it may well be necessary to reframe the referrer’s question into one that is neuropsychologically meaningful and possible to answer, as neuropsychological assessments are time-intensive and should not be seen as ‘trawling’ exercises;
- **the patient’s demographic variables**, for example, age, handedness, education/qualifications, current/previous profession and cultural background, in order to set the context for the interpretation of current test performance; understanding the difference between different types of educational attainments (e.g., grades attained for GCE O levels, CSEs, GCSEs, A levels, AS and A2 examinations within the English educational system) will also be informative when considering
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The premorbid level of ability, and additional information concerning developmental stage reached will be particularly important in the case of children (see Chapter 13);

- the patient's previous as well as current medical history, as this may also be relevant to the development of cognitive impairment; history of alcohol and/or substance abuse;

- the results of previous investigations, for example, neurological investigations, EEGs, CT/MRI or functional brain scans, x-rays, biochemical tests, (see Chapter 3 for a description of neurological investigations) and previous (as well as current) psychiatric diagnoses, all of which can assist in the formulation of hypotheses about the patient's likely deficits, and so guide the assessment and its interpretation;

- the results of previous neuropsychological assessments; these can guide the choice of current tests and permit evaluation of change (see below);

- the history of the person's lesion/disorder, for example, site of trauma, age at and time since injury or onset of illness, history of epilepsy (either predating injury or post-traumatic) if relevant, whether or not anoxic episodes were associated with injury, length of post-traumatic amnesia (PTA) and retrograde amnesia, length of loss of consciousness, Glasgow Coma Scale scores, and operation reports, since again these will assist in the formulation of hypotheses about the aetiology, nature and severity of the deficits that may be revealed by the examination;

- factors that might affect testing, for example, drug types and levels (see Chapter 5), the timing of the assessment in relation to drug ingestion, which may have a direct effect on whether or not the person can be assessed (e.g., in the case of drugs used to treat Parkinson's disease, where 'off' periods at the end of the drug's effectiveness may make assessment extremely difficult or impossible), recent epileptic seizure activity (if relevant), mood and motivation (see Chapter 4), motor/speech/visual problems (which may determine which tests are feasible to administer), and the patient's likely distractibility;

- informants' views of the person, their deficits and if/how they have changed; many patients with acquired brain injury will have little insight into the reason for their referral for assessment/treatment, and the nature and/or extent of their own cognitive deficits. Thus, informants may provide important information about the areas to be explored in the neuropsychological assessment (see Chapter 9);

- the context in which the assessment takes place, that is, whether there are relevant compensation or other medicolegal factors that might affect the person's motivation during the assessment.

While not all of the information will be available in every case, it is important to gather as much information as possible prior to seeing the patient since, as indicated with respect to medicolegal work in Chapter 17; this also permits the clarification with the patient of inconsistencies in the history and allows what may be a limited time in which to undertake an assessment to be used to cover the most important areas of that person's cognitive function.
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The selection of the tests to be administered then needs to be based on

- predictions of the likely range of deficits to be found, given what is known about the person's history, neurological investigations, presenting complaints and the neuropsychological profile of that particular disorder and other relevant disorders that may form part of a 'differential diagnosis';
- the time available in which to undertake the assessment (e.g., it may be practical to assess an inpatient on more than one occasion but only one session may be possible, albeit less than desirable, for someone living at a great distance from the clinical setting) and the patient's likely tolerance of testing;
- the suitability of the test in terms of its standardization when compared with the patient, that is, whether or not the patient is similar to the standardization sample in terms of IQ, age and so on;
- the potential adaptability of the test to overcome problems posed by the patient's motor/speech/sensory deficits and how this might affect interpretation of the results that are obtained;
- the need for an interpreter where the patient's first language is not the same as that of the psychologist or that in which the test is published/standardized;
- the tests that have previously been administered, that is, one may need to use parallel forms of tests if they are available and consider the possibility that practice effects may be present on other measures, serving to mask deterioration;
- whether the patient is part of a research cohort (e.g., evaluating a neurosurgical intervention for epilepsy; deciding upon the suitability of the patient for pharmacological treatment of dementia – see Chapter 23), in which case a fixed protocol may be required for the assessment;
- whether it will be particularly important to use tests that are statistically interrelated (e.g., the Wechsler Test of Adult Reading, the Wechsler Adult Intelligence Scale (WAIS) – 3rd Edition and the Wechsler Memory Scale – 3rd Edition, or, as will become increasingly used, the Test of Premorbid Functioning (TOPF), the Wechsler Adult Intelligence Scale – 4th Edition (WAIS-IV) and the Wechsler Memory Scale – 4th Edition) or whether this would pose too taxing an assessment load for the patient to yield interpretable data, in which case other tests might be more suitable;
- what is then found during the assessment, that is, one may wish to follow up on specific findings with further standardized tests or the development of more idiosyncratic measures using a single case design.

It will not be uncommon for a clinician to develop greater familiarity with some tests than with others (see also Chapter 9), but the clinician should remain open to the need to be flexible in their choice of tests when this enables them better to answer the clinical question being posed in an individual case. It is also important to remain up to date with the development of new neuropsychological tests and to be aware of the psychometric implications of changing between older and newer versions of similar tests for the interpretation of between-assessment results. An
important example of this is the difference in IQ scores yielded by different versions of the Wechsler Adult Intelligence Scale.

There is also a clear balance to be drawn between undertaking an adequate assessment and overassessing a patient. It is a frequent mistake for inexperienced clinical neuropsychologists to suppose that the more tests given, the better. It is also not uncommon to see reports where patients have been subjected to hours and hours of testing. This is rarely necessary. If, after several hours of testing, one is still unsure of what to conclude, it will normally be more informative to gather other types of data, such as direct behavioural observation, or to interview staff or relatives of the patient rather than to reach for yet another standardized test. However, considerable importance also needs to be attached to the overall scope of the assessment in being able to rule out the presence of cognitive impairment. Thus, one should always be aware that deficits, for which the patient has not been assessed, cannot be ruled out definitively. Teuber’s widely cited view (see, for example, Walsh and Darby, 1999) that ‘absence of evidence is not evidence of absence (of impairment)’ continues to be an important reminder that generalizations cannot be made from limited assessments. Clinicians should always specify the factors limiting their interpretations, making it clear to the reader exactly what tests were undertaken as part of their assessment of the patient.

We will now address a number of other important issues, which also arise when interpreting and reporting the results of a neuropsychological assessment.

- One should not overinterpret minor discrepancies between test scores. It is common to see in reports that a patient who scores at the 10th percentile on one measure is then felt to be significantly relatively impaired on other measures on which they score at the fifth or second percentile. The difference in reliability of different tests means that such small differences may not necessarily be interpretable in terms of trying to identify specific deficits (see also Chapter 9). In addition, likely premorbid levels of functioning need to be taken into account when trying to decide whether a currently average level score represents intact performance or evidence of change following acquired neuropathology (see Chapter 6, for a further discussion of important psychometric concepts to consider in test interpretation).

- It is important not to rely on test scores alone when deciding whether an impairment is present. Any clinical neuropsychological report should make some reference to the behaviour of the patient during testing and the manner in which they go about solving the tasks and should give at least some brief details of difficulties the patient is reporting in everyday life. Shallice and Burgess (1991) described three patients with strategy application disorder who performed normally on traditional neuropsychological tests including many measures of executive functions but nevertheless had profound difficulties in everyday life (see Chapter 9, for further details). These cases (see also Goldstein et al., 1993) illustrated the potential danger in over-reliance on formal test performance in deciding whether the patients did or did not have neuropsychological deficits. Indeed, in some
disorders (e.g., frontotemporal dementia), diagnostic criteria place greater weight on behavioural change than on cognitive evidence (e.g., Neary et al., 1998; see also Chapter 15).

- Similarly, a diagnosis should never be made purely on the basis of neuropsychological test results. There are many different reasons why patients may fail tests, so it is never sufficient to rely purely on test performance. If a patient shows a pattern of performance that would be consistent with a particular disorder, then the most that can be concluded is that their performance is consistent with that disorder, not that they have the disorder (see also Chapter 9). Similarly, neuropsychological tests results should never be used by a clinical (neuro)psychologist to make a diagnosis for which there is no a priori medical basis, as they will be acting outside their area of expertise and place themselves at risk of disciplinary and other action.

- One should not be afraid to conclude that test performance cannot determine what the causal factors are in a patient’s current problems. For example, in the case of a patient with a history of psychosis and current cognitive problems or learning difficulties who then has a moderate head injury, it may not be possible to tease out to what extent current problems existed premorbidly or were recently acquired, apart from relying on the reports of relatives, friends, or staff who knew the patient before the head injury. Similarly, medication effects (see Chapter 5) may exaggerate or obscure certain deficits. There is nothing distinctive about neuropsychological tests, which means they are only failed by patients with some kind of acquired brain injury.

- It is also important to acknowledge that more than one assessment may be necessary in order to arrive at an accurate interpretation of a patient’s difficulties; this is often the case when attempting to distinguish, for example, between a developing dementia and depression. Here, a further assessment, once an affective disorder has been treated effectively, may permit clarification of whether the person is demonstrating a progressive, neurodegenerative condition (see Chapters 4 and 14, for further discussion).

- It is not uncommon to see reports that conclude that because a patient passes tests of malingering, they cannot be faking a bad performance; this is incorrect. If the tests of malingering were developed by asking normal controls to fake a bad performance, then it does not necessarily follow that a patient with a mild injury who is trying to accentuate a deficit on formal testing will perform in the same way.

- A consistently perfect correspondence between CT/MRI scan results and performance on formal neuropsychological tests does not exist (which is not surprising, as they are measuring very different things – see Chapter 9 – and different types of scan may be more sensitive to particular types of neuropathology than others – see Chapter 3). It is therefore possible to find patients who have normal structural brain scans with significant cognitive deficits, or the converse pattern of a patient with an abnormality on brain scanning but intact performance on formal cognitive tests. Evidence from a brain scan should be used not to
confirm or disconfirm the validity of observed cognitive deficits but rather to offer possible hypotheses as to why the observed deficits may be occurring; test sensitivity and premorbid levels of ability may be factors that need to be considered in interpreting the correspondence or otherwise between different forms of assessment.

- Although many neuropsychological tests are now supposedly ecologically valid, very few provide any formal evidence to support this claim (with the notable exception of some of the tests originally published by the Thames Valley Test Company, such as the Behavioural Assessment of Dysexecutive Syndrome (BADS; Wilson et al., 1996) and the Rivermead Behavioural Memory Test (Wilson, Cockburn and Baddeley, 1985). Recently the range of ecologically valid assessments has extended into the field of driving (see Chapter 24). Great care should, however, be taken before drawing conclusions about how a patient will function in everyday life based on neuropsychological test performance alone.

- Remember that a clinical (neuro)psychologist is an independent professional in their own right, with a responsibility to the patients they assess and treat. One should not be afraid to question the appropriateness of referrals. It is always best to take responsibility for providing feedback of one’s test results oneself, since other professions are far less likely to have the in-depth understanding of neuropsychological tests, although it should be medical practitioners who deliver medical diagnoses if multidisciplinary feedback sessions are not possible. Issues relevant to the provision of feedback to people with neuropsychological impairments are discussed by Gass and Brown (1992).

- Interpretation of neuropsychological assessments will be enhanced in certain cases by a good working knowledge of psychiatric disorders, their presentation, and diagnosis.

It would be difficult to illustrate the relevance of all the above suggestions for clinical practice in such a short chapter. What follows is a selection of case examples highlighting a number of the points we have made above and demonstrating the diverse issues that assessments may raise. These descriptions are based around real clinical presentations, but sufficient details have been changed in all three cases to ensure anonymity. Tests referred to will be those to which clinicians should currently be able to gain access.

**Case Examples**

**Social problems or the consequences of a previous head injury?**

**The importance of a good history**

Ms Y, a 42-year-old, right-handed single mother, was referred for a neuropsychological assessment as a preliminary part of care proceedings being undertaken by the local authority in connection with her three children whose behaviour she was having difficulty controlling. Despite considerable social services input, she was
unable to manage her household affairs. Another Clinical Psychologist had wondered whether a neuropsychological assessment might be warranted by Ms Y’s apparently disorganized behaviour, and had heard that Ms Y had sustained a head injury many years previously. Little other information was available about her history, so Ms Y gave consent for her General Practitioner (GP) records to be obtained. It was these records that provided some of the information indicated in Chapter 3 as being very important in understanding her presentation.

Although Ms Y’s GP queried the value of the release of her medical records, since all her problems were social ones, her records indicated that, at the age of 17 years, she had sustained a significant head injury as a pedestrian and was unconscious for five days. Only after a further 10 days or so could she begin to cooperate with instructions and speak short sentences. Her physical progress was good, but she retained some facial asymmetry and slurred speech. At the time, an IQ assessment (test unspecified) yielded an IQ of 110, but she was reported to show a marked emotional deficit, lack of drive and initiative, an increased tendency towards immature behaviour, and dependence. Two years later, she was still felt to have very little insight into her deficits. She was unable to continue to train as a secretary, as she was slow and forgetful, and showed insufficient initiative. Her social life was severely curtailed following the accident. There were, therefore, sufficient behavioural descriptions from her medical records to suggest residual, significant deficits resulting from what was an apparently severe head injury.

Although no scanning information was available to demonstrate any long-term neuropathological sequelae of her apparently severe head injury, the requested neuropsychological assessment was undertaken with a view to determining whether deficits could be elicited that would be consistent with a dysexecutive syndrome (see Chapter 9). Her behaviour during testing was rather distractible, and she was unable to pick up on social cues to indicate that she should cease chatting and continue with the tests.

On the WAIS-IV, Ms Y obtained a Full Scale IQ of 98. Her premorbid estimated IQ on the basis of her reading ability on the Test of Premorbid Functioning was 115. There was therefore some slight suggestion of an overall reduction in her general level of intellectual ability.

Given the early descriptions of Ms Y’s memory difficulties, and the common association between acquired memory impairment and head injury, a number of memory tests were administered. Ms Y’s ability to recall a short story from the BIRT Memory and Information Processing Battery (BMIPB) was above average (75th to 90th percentile) for both immediate and delayed recall. However, learning of a list of 15 words revealed no consistent strategy for encoding the words, and overall learning was only at the 10th percentile. Immediate and delayed recall of a complex geometric figure were at the upper end of the average range, but learning of an abstract design fell between the second and 10th percentile, and was characterized by frequent errors and perseverations of previously incorrect lines.

In terms of her performance on measures of executive functioning, despite performance on the Controlled Oral Word Association Test consistent with that predicted on the basis of her reading ability (Crawford, Moore and Cameron, 1992) and
completion of Parts A and B of the Trail Making Test that fell in the 50th to 75th percentile ranges, completion of the Stroop Test was only at the fourth percentile. She also failed several subtests from the BADS, showing poor cognitive estimation, planning, sequencing, and rule-following ability.

Thus, despite Ms Y’s IQ remaining in the average range, her head injury was likely to have produced lasting impairment, particularly in the domain of executive functioning, whereby she had difficulty in organizing information to be remembered, in undertaking cognitive estimation tasks where checking the plausibility of a response is required when the person has to use everyday information to answer a question (Shallice, 1988), in inhibiting unwanted responses and in planning tasks that require a strategy for their effective completion. She had never received any rehabilitation after her head injury (indeed appropriate cognitive rehabilitation of the sort described in Chapter 9 would not have been available to her at that time), and it was likely that in an unstructured and less predictable everyday situation, her deficits would have had a more marked impact on her everyday functioning, making it more difficult for her to care effectively for her children. Understanding the nature of her head injury and its immediate sequelae had been particularly helpful in this case in terms of trying to identify the likely origin of her everyday difficulties, although in the absence of neuroimaging data, it was not possible to say with certainty that she had damage specifically to the frontal lobes (see Chapter 9).

Evaluating the validity of memory and other indices of cognitive impairment in the context of medically unexplained symptoms

Mrs B, a 40-year-old wheelchair-dependent lady, had, as one of her main complaints, the fact that she could not remember what she recently said or done. She also said that recall of childhood events fluctuated and could not account for these variations. These difficulties had worsened over the previous year, and she found these very frustrating in her interactions with her children. Overall, her health had been good until about six years prior to the current assessment, when she developed a serious urinary-tract infection (UTI) and been admitted to hospital. She had apparently developed a pulmonary embolism (PE), and Mrs B. indicated that she had been unconscious for at least two weeks at that time. Inconsistent reports of MRI scans indicated variously no abnormalities and evidence of vascular changes in both hemispheres, but an MRI at around the time of the current assessment was reported as normal. Apparently, at the time of the UTI and PE, she had begun to notice a loss of sensation in her feet. Other symptoms then developed over the next three years and included increasing sensations of pain and weakness in her legs. She began to need to walk with the aid of a stick, and this progressed so that having become dependent subsequently on a Zimmer frame to walk, she ultimately became confined to a wheelchair, although the actual time course of this deterioration in mobility was inconsistently reported by the patient and others involved in her care.
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Of note in Mrs B’s personal history were an ongoing acrimonious divorce and the need to move out of the matrimonial council house, so that she was needing to seek rehousing, preferably in a property suited to her physical needs. Her mobility difficulties had prevented her from working as a playground attendant in the local school for the past four years, and she was in receipt of a number of state financial benefits.

Given the reported loss of consciousness after the PE, Mrs B had undergone a previous neuropsychological assessment early in the development of her physical difficulties. This was before her memory difficulties had been reported. She had been found to have a Verbal IQ of 91 and a PIQ of 84 (i.e., in the Average and Low Average ranges) on the Wechsler Abbreviated Scale of Intelligence (WASI), which had been interpreted as being in keeping with her occupational history. However, her scores on memory tests were all in the impaired range, as were her scores on tests of verbal fluency; her scores on the Hayling and Brixton Tests (see Chapter 9) were all impaired, but her naming ability was in the average range.

Some five years later, in the context of reportedly worsening memory, she underwent a further assessment. She was cooperative with the assessment process, but her responses were characterized by a large number of ‘don’t know’ responses. She did not appear to have any difficulty comprehending test instructions, despite having a forwards digit span of only three digits.

On the WAIS-IV, she obtained a Verbal Comprehension Index of 63 and a Perceptual Reasoning Index of 69. Her Working Memory Index was 55, and her Processing Speed Index was 57. While the scores were not directly comparable with those on the WASI, there were indications of considerably lower-level functioning with, for example, a scaled score of 2 on WAIS-IV Vocabulary compared with a previous scaled score of 11 on the WASI, and current scaled score of 4 on Block Design, whereas a score of 9 had previously been obtained.

Memory scores on the BMIPB were all below the 10th percentile and mostly below the second percentile. On further testing on the relatively easy Pictorial Recognition Memory Test (from the Camden Memory Tests), she scored only 8/30 (a score of 28–30 indicates intact performance), and scores on the Doors and People Test (administered five years previously) were all at floor level.

Having previously obtained a score on the Graded Naming Test in the average range, Mrs B’s current score was now between the first and fifth percentile. All measures of executive function yielded impaired scores, with results broadly similar to those previously obtained.

In view of the apparent substantial decline in Mrs B’s performance on measures of intellectual ability and naming, as well as floor levels of performance on many other tests and unusually low levels of recognition memory on the Pictorial Recognition Memory, measures of ‘effort’ or symptom validity were employed (see also Chapter 17) in an attempt to gain some indication as to whether psychological factors may have been contributing to her apparent cognitive decline across the assessments. Although, in the United Kingdom, the consideration of effort during psychological assessment is a relatively new area, it is not always appropriate for such measures to
be incorporated into assessments (British Psychological Society, 2009); in Mrs B’s case, the measures used were to some extent guided by the findings of Kelly et al. (2005) as well as incorporating one of the more widely used measures of effort, the Test of Memory Malingering (TOMM; Tombaugh, 1996).

On the TOMM, which is a forced-choice recognition memory test consisting of 50 line drawings to be remembered, Mrs B scored 13/50 in Trial 1, 11/50 in Trial 2 and 8/50 in the retention trial. The recommended cutoff scores for detection of suboptimal effort is a score of 45 on both Trial 2 and the Retention Trial, and indeed scores on the retention trial should be higher than on Trial 2. On the Coin-in-the-Hand Test (Kapur, 1994), she responded correctly on 2/10 trials; the cutoff for detection of possible suboptimal effort is a score below 8.5/10. On Rey’s 15-item test (Rey, 1964), which is a simple test of visual recall requiring the reproduction of five rows of three items, Mrs B recalled only six items, that is, below the cutoff score of 8 (Kelly et al., 2005). She also obtained a scaled score of only 3 on the Mental Control scale from the Wechsler Memory Scale – III, and on Wiggins and Brandt’s (1988) Autobiographical Memory Interview, she was not able to recall the postcode of her address, her telephone number or her siblings’ names.

The poor scores on the five measures used to assess ‘effort’ or motivational factors therefore yielded scores that consistently threw doubt on the validity of her poor achievements on more typically administered tests of memory. These scores were highly suggestive, therefore, that motivational factors were influencing test performance and also raised doubts as to the validity of her other test scores and the degree of deterioration that might otherwise have appeared to occurred since the previous assessment. This also meant that it was not possible to disentangle her true ability on measures of cognitive function from the possible motivating factors on test performance during the current assessment. While Mrs B may have suffered a serious illness at the time of the onset of her physical symptoms, it is possible that the considerable stresses in her personal life, including her divorce and the need to be rehoused, and a possible inability to cope with these may have contributed to her presentation. While her scores on the measures of effort were rather extreme, and perhaps unusually consistent in their severity (Kelly et al., 2005), it was still useful to use a number of these tests rather than a single measure. The use of the term ‘malingering’ is a contentious one (e.g., Tombaugh, 1996), and at best it was only possible to feed back to her that psychological processes may have been influencing her cognitive ability. It would also not be appropriate to decide on the basis of test scores alone that a person may be malingering, and a range of behavioural observations and other considerations should be employed.

Post-concussional syndrome or post-traumatic stress disorder after a mild head injury? The importance of knowing about psychiatric as well as neurological diagnoses

Mr P was a 25-year-old right-handed man, who was a passenger involved in a road-traffic accident six months earlier. He had sustained a mild head injury with
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A short loss of consciousness (10–15 min) and orthopaedic injuries, which required an eight-week stay in hospital. The driver of the car, who was a close friend of Mr P, was killed in the accident.

Prior to the accident, Mr P was working as an IT consultant. He had been off work for four months after the accident and had recently returned to work but found he was encountering problems. He had been to see his GP because he was aware of difficulties with his memory and concentration, as well as increased irritability. He was not sleeping, was experiencing headaches and reported feeling anxious. His GP had referred him for a neurological opinion and a CT scan, which was reported to be normal. The neurologist referred him for a neuropsychological opinion.

In view of the severity of the accident and the death of his close friend, the differential diagnosis was between post-traumatic stress disorder (PTSD) and post-concussional syndrome (PCS). The cardinal features of PTSD (e.g., DSM-IV; American Psychiatric Association, 1994) are intrusive thoughts or nightmares about the event and avoidance of situations related to it, combined with symptoms of heightened arousal. Some authors such as Sbordone and Liter (1995) have claimed that PTSD does not occur following mild traumatic brain injuries, since there is usually amnesia for the precipitating event. However, more recent studies have suggested that PTSD can occur even with severe head injuries where there is amnesia for the event (McMillan, 1996; McNeil and Greenwood, 1996).

PCS is a term used to refer to range of symptoms that may arise after mild traumatic brain injury (where loss of consciousness is less than 20 min and PTA less than 1 h). These include headache, insomnia, sensitivity to noise, poor memory and concentration, irritability and anxiety and depression. For most cases these symptoms will resolve within a few weeks of the injury but a minority of patients may still show symptoms several months later (e.g., Wrightson and Gronwall, 1999).

On interview Mr P could not remember the accident itself but he could remember arriving at his local Accident and Emergency department by ambulance and had reasonable memory for events after this, suggesting a PTA of less than 1 h. He reported feeling very distressed about the death of his close friend. He was experiencing some anxiety when travelling as a passenger in a car, and he was more reluctant to travel by car than he had been before the accident. However, he did not report any re-experiencing phenomena such as nightmares, ‘flashbacks’ or intrusive thoughts about the accident. This lack of any re-experiencing symptoms would preclude a diagnosis of PTSD.

On formal neuropsychological assessment, Mr P performed slightly below his estimated premorbid level of functioning (WAIS-IV FSIQ 97; TOPF-predicted FSIQ 110). He was found to have particular difficulty with strictly timed tasks, and he performed very poorly in terms of his backwards digit span.

Mr P was found to have mild memory problems on formal testing. He performed poorly on immediate recall of the story and figure from the BMIPB (BMIPB Story recall, 10th percentile; Figure recall, second percentile), although he did not show any further loss of information after a 40-min delay. He also had difficulties with the Doors and Names recognition subtests from the Doors and People test (Doors, fifth to 10th percentile; Names, fifth percentile).
His visual perceptual and visuospatial skills were satisfactory (VOSP Object De-
cision, 18/20; Position Discrimination, 19/20), and he did not show any language
difficulties in spontaneous speech or on naming to confrontation (Graded Naming
Test, 23/30).

His performance on tests of executive functioning was poor. He obtained a poor
score on the Brixton Test (error score = 26; scaled score = 2), and he had marked
difficulties with the Hayling Sentence Completion Test (overall scaled score = 1).
His verbal fluency was slightly lower than that predicted by his reading ability
(Crawford, Moore and Cameron, 1992). He also had problems with tests of speed
and concentration, and was slow and inaccurate on the BMIPB Information Pro-
cessing subtest.

Mr P did not rate himself as depressed on the Hospital Anxiety and Depression
Scale, but he did rate himself as mildly anxious (HADS depression score = 5; anxiety
score = 9).

Thus, Mr P was exhibiting significant cognitive difficulties on formal testing
with memory, concentration and executive impairments that confirmed the every-
day problems he had reported. This degree of cognitive impairment would not be
expected to be observed simply as a result of PTSD. He was exhibiting anxiety symp-
toms, and he was avoiding some situations related to the accident itself. However, as
already indicated, the lack of re-experiencing phenomena such as nightmares, ‘flash-
backs’ or intrusive thoughts would preclude a diagnosis of PTSD. He was therefore
felt to be suffering from the residual effects of his mild brain injury combined with
additional emotional problems arising from the death of his close friend. Mr P was
given education about head injury and strategies for coping with his memory and
attentional problems. He was also given advice about attempting a more gradual
return to work and offered counselling sessions to address emotional issues. Jones
(1974) found that only 1% patients with mild head injuries showed persistent symp-
toms at one year. It was therefore recommended that he be reassessed after a further
six months to ensure that his symptoms had recovered.

Clinical Neuropsychology as a Professional Specialty:
Who is a Clinical Neuropsychologist?

The discussion so far has dealt with issues relevant to the day-to-day practice of
clinical neuropsychology, with respect to how one should go about one's work.
However, given the growing specialization of clinical neuropsychology, the issue of
professional competence and titles becomes increasingly important.

In the United States, a clear definition of who is a Clinical Neuropsychologist
(American Psychological Association (APA), Division of Clinical Neuropsy-
chology, 1989) emphasized the doctoral level of didactic and experiential training
that will have been undertaken in both neuropsychology and neuroscience at an
accredited university, the acquisition of at least two years of appropriate super-
vised training where the person is delivering clinical neuropsychological services,
peer review of their competencies and the compliance with local requirements for
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licensing and certification in the state in which the person practices. The APA’s Division of Clinical Neuropsychology has indicated the value placed upon the acquisition of the ABCN/ABPP Diploma in Clinical Neuropsychology as providing the clearest evidence that their criteria have been met. Updated definitions of neuropsychology are being considered (http://www.div40.org/def.html), but currently a similar position concerning qualifications is being maintained (http://www.div40-anst.com/training.html).

A number of European countries have developed graduate and postgraduate training programmes (see, for example, Kaschel et al., 1994). In the United Kingdom, clinical neuropsychology has also recently been recognized as a specialty. The Health Profession Council (HPC) is the statutory regulatory body for all practitioner psychologists, and all clinical psychologists who wish to practise or use the title Clinical Psychologist must be registered with them. The British Psychological Society’s (BPS) Division of Neuropsychology (DoN) has now developed a specialist register of Clinical Neuropsychologists, for those clinical psychologists who have achieved a recognized level of competence in the field of neuropsychology. Up until the end of 2003, it was possible to demonstrate this competency through grand-parenting clauses, but now all candidates must undertake the society’s Qualification in Clinical Neuropsychology (QiCN) (previously known as the Practitioner Full Member qualification) in one of its two forms:

- Adult Clinical Neuropsychology
- Paediatric Clinical Neuropsychology.

The full regulations and syllabus for the Qualification in Clinical Neuropsychology have been outlined (British Psychological Society, 2010a, b), but essentially to be eligible to enrol for these qualifications, candidates will have to provide evidence they:

- have acquired the Graduate Basis for Chartered Membership (GBC) with the BPS;
- are a Chartered Member of the Society;
- are eligible for Full Membership of the Division of Clinical Psychology (DCP);
- and
- are registered as a Clinical Psychologist with the HPC.

In order to enrol for the paediatric clinical neuropsychology qualification, candidates must satisfy the first two criteria but may be eligible for full membership of either the DCP or the Division of Educational and Child Psychology, and can be registered with the HPC as a Clinical or Educational Psychologist.

The QiCN consists of three parts:

- Part 1 – Knowledge dimension – Four 2-h exams covering underpinning knowledge relevant to clinical neuropsychology or completion of a BPS-accredited course in clinical neuropsychology.
- Part 2 – Research Dimension – evidence of competency in clinical research. Research completed as part of a clinical doctorate may allow exemption.
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- Part 3 – Practice dimension which requires two years of supervised practice with a clinical log and clinical supervision log. Six case studies must also be submitted for an oral examination.

Obviously, anyone seeking to enrol for this qualification should seek to obtain the most up-to-date guidelines available, but it is clear that this qualification is being seen as a means of identifying both competent practitioners and the requirements of competent practice. It may clearly influence the principles of ethical practice by which clinical neuropsychologists work.

The BPS's Division of Neuropsychology (2000) has already set out guidelines for professional practice in the field of clinical neuropsychology. While always subject to development and revision, these guidelines emphasise the importance of the level of competence and experience of the person wishing to offer clinical neuropsychological services and the need to seek supervision from a member of the Specialist Register of Clinical Neuropsychologists where such experience might be lacking, with respect to both administration and interpretation of neuropsychological tests. The laudable aim of protecting the public from unqualified, incompetent psychologists claiming proficiency in clinical neuropsychology may, unfortunately, have led to an unintended division between academic and clinical neuropsychologists. With the abolition of the Practitioner Full Membership grade for the BPS DoN, academic neuropsychologists will no longer be able to be full members of the Division. Historically, one of the great strengths of neuropsychology has been the very close link between academic and clinical neuropsychology, and we sincerely hope that this development will not jeopardise any future collaboration.

Of course not everyone required to demonstrate neuropsychological knowledge in the clinical work in non-neuropsychology settings will wish (or find it possible) to acquire the QiCN. However, this should certainly not dissuade clinical psychologists from acquiring sufficient skills in neuropsychological assessment and test interpretation in order to, within the boundaries of their level of competence, undertake effective pieces of work with their patients and know when to refer on to more specialist services.

Conclusions

This is a particularly interesting time to be presenting an overview of key areas of clinical neuropsychological practice and its relevance to clinical psychology practice in general. This is because of the enormous development of the neuroscientific context in which neuropsychology is housed, the increasingly sophisticated neuropsychological assessment techniques available and the considerable strides made in developing evidence-based treatments for patients with neuropsychological impairments. It is an area of clinical work in which the clinical psychologist can see themselves as uniquely skilled and able to make an important contribution to the overall care of their patients.
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