

# Summary and guidelines for neuropsychological rehabilitation

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# SUMMARY AND GUIDELINES FOR NEUROPSYCHOLOGICAL REHABILITATION

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and Barbara A. Wilson*

In this final chapter we present an overview of the chapters presented in the handbook and conclude with guidelines that are recommended for neuropsychological rehabilitation (NR), whether in clinical practice, programme development or research. Reference is made to the chapters that offer specific information on these areas.

## Summary

The handbook starts with five chapters presenting general issues in neuropsychological rehabilitation, including a historical overview and current position in health care for people with brain injury. In addition, guidelines for evidence-based treatment, neuropsychological assessment and goal setting are given. The section includes a chapter on mechanisms of recovery after brain damage and the contribution of neuropsychological rehabilitation to spontaneous recovery.

In Section Two, information on the populations referred for neuropsychological rehabilitation is offered: adults with non-progressive and progressive conditions, children with traumatic brain injury and other conditions, people with disorders of consciousness, psychiatric disorders and other conditions seen for rehabilitation.

In Section Three, the following cognitive disorders are discussed in terms of their occurrence, assessment and rehabilitation: information processing speed, attention, working memory, memory, executive functions, language, visual perceptual and visual spatial abilities, praxis, social communication, social cognition, social and behavioural control and apathy. The management of challenging behaviour in both inpatient and community settings is discussed. In all chapters, separate sections for children and adults are written when appropriate.

Section Four is devoted to the rehabilitation of psychosocial disorders in which first generation and third wave cognitive behavioural therapies, the management of self-awareness and identity issues are first discussed. These chapters are followed by a chapter on psychosocial programmes for children, including working with schools and families. The section ends with chapters on family-based support and vocational and occupational rehabilitation.

Section Five deals with recent and emerging issues in neuropsychological rehabilitation: fatigue; sexuality; music therapy; novel forms of rehabilitation such as computer-based cognitive retraining

and non-invasive brain stimulation; and new technologies, including digital technologies, technology-based delivery of services, and social robotics.

In current society health-care resources are limited, especially in developing countries. This is the topic of Section Six, starting with a chapter on cost-effectiveness of neuropsychological rehabilitation. Next, a global perspective of neuropsychological rehabilitation is presented and cultural considerations are discussed. The chapter is completed with a description of rehabilitation in different countries around the world.

The final section of the handbook is devoted to the evaluation of neuropsychological rehabilitation in which the choice of outcome measures, avoiding bias and other challenges are discussed. Finally, we present guidelines for the development of best practices.

## **Guidelines for neuropsychological rehabilitation**

Best practice in neuropsychological rehabilitation (NR) is achieved by following these guidelines.

### ***Overall pathway of care***

Neuropsychological rehabilitation is available from acute hospitalisation through inpatient rehabilitation to outpatient and post-acute care, with maintenance plans for those requiring episodic interventions throughout the life span. Ideally, a *pathway* of care exists that provides smooth transitions through each stage with good communication between all health-care providers. Processes of spontaneous neurological recovery mostly occur in the first months post-injury (Chapter 3), while compensational strategies and the use of technological and other external aids (Chapters 34, 35, 36 and 37) can be considered even many years after the injury. Vocational and occupational rehabilitation (Chapter 30), family-based support (Chapter 29) and working with families and schools (Chapter 28) are also delivered mostly in the post-acute and chronic phases post injury.

### ***Partners in rehabilitation: clients, families, professionals***

Neuropsychological rehabilitation is both *client-focused and family-centred*, with the client playing an essential role to the extent possible in setting goals, choosing strategies and approaches, and reviewing progress. Individual and group sessions start with a review and agreement on the goals that have been set. In Chapter 5, goal setting in neuropsychological rehabilitation is discussed.

*Families* are involved from the beginning and throughout the course of neuropsychological rehabilitation. Family-based support is discussed specifically in Chapter 29. Brain injury is seen as a family problem that affects each member in unique ways and requires that each member receive appropriate information, engagement and personal therapy, as needed. Family or couples therapy is offered as needed. Working with families is one of the topics of Chapter 28.

We see people's social networks and environments more generally as facilitating changes in rehabilitation, and promoting and sustaining change following rehabilitation. This is especially true for children, for whom families and schools may serve as the scaffolding and agents for therapeutic change, as is highlighted in Chapters 14B, 17B and 28.

Wade and Glang's chapter (Chapter 28: Psychosocial Interventions for Children/Working with Schools and Families) notes that:

- A facilitative home environment characterised by warm, responsive parent-child interactions can reduce the sequelae of neurological insult; hence the importance of intervening at a family level to promote positive adjustment for the child.

- The quality of school-based services and parent–school liaisons impact both children’s cognitive and behavioural recovery.
- For adolescents especially there needs to be a focus on their peer group and school interactions – interpersonal skills and social participation take on increasing importance and can affect learning and school performance

Douglas and Togher’s chapter (Chapter 21: Managing Acquired Social Communication Disorders) highlights the importance of communication partners (usually family members) in the management of social communication problems after brain injury. They recommend a dual focus on training the social communication skills of the person with brain injury and his/her communication partners.

In Chapter 22 (Rehabilitation of Social Cognition Disorders) by McDonald and Cassel, they similarly argue the need for ecological assessment of social cognition in order to understand social contextual influences on people’s skills. More recently there has been a shift from remedial or bottom-up approaches for training social cognition to more context-specific training that targets skills in real social and situational contexts.

Few areas of human functioning are as personally important and yet so often ignored as that of sexuality. Chapter 32 sensitively addresses changes in sexuality after acquired brain injury (ABI), both sexual functioning, including physiological aspects of sexual performance, and sexual well-being, referring to a person’s subjective experience of sexuality. The importance of including partners in addressing sexual changes is stressed, along with the need to train and educate all professionals working with people whose sexuality may be affected by brain injury. The chapter highlights the need for sexuality to be routinely addressed in the rehabilitation process and following return to the community. Information about sexuality following brain injury should be provided as a matter of course and permission given to discuss sexual issues.

*Professional training* includes course work and clinical practice in neuropsychological rehabilitation. Each discipline develops a curriculum that includes general information and experience about brain injury rehabilitation as well as discipline-specific knowledge and approaches. In addition, recent findings (Pagan et al., 2015) suggest that training that includes a multidisciplinary focus will provide rehabilitation professionals with a necessary understanding of shared or complementary areas of practice in addition to more discipline-related expertise in order to assure good teamwork.

Neuropsychological rehabilitation is best accomplished with *teams*, which can be multidisciplinary, interdisciplinary or transdisciplinary. Members of multidisciplinary teams work in parallel but have clear role definitions and tasks, whereas interdisciplinary teams collaboratively discuss and set treatment goals and jointly carry out treatment plans (Körner, 2010). Therapists work together in teams and address shared goals through regular communication. When a team is truly transdisciplinary, certain therapy activities can be undertaken by any team member. For example, if a client is unwilling to travel on the train due to cognitive and communication difficulties that increase anxiety and lower confidence, any therapist (in this case, speech and language therapist, occupational therapist or psychologist) could conduct a behavioural experiment in which cognitive strategies are used, communication scripts are learnt, and calming exercises are undertaken to help the client engage in the feared activity. Teamwork is especially important when working with people with challenging behaviours (as discussed in Chapters 23 and 24) or people with psychiatric disorders (Chapter 11).

### ***Rehabilitation process: assessment***

Neuropsychological rehabilitation is based on careful *assessment* that is interdisciplinary (or transdisciplinary) and multimodal. Assessment may be done repeatedly to monitor progress (i.e. recovery or decline), evaluate treatment results and so on. It includes not only standardised testing but also behavioural observations, functional tasks, interviews and questionnaires. Information is

gathered both from the client and from families or other relevant people. Each discipline contributes its own skills and knowledge base and perspectives, and these are shared within team meetings.

Chapter 4 describes the methods and processes of assessment specific for neuropsychological rehabilitation. In Chapter 42 on outcome measurement, issues related to assessment as it pertains to the evaluation of treatment are presented. Special emphasis is placed on the measurement of participation after brain injury, since participation in society is one of the major goals of rehabilitation. Although space precludes us from covering every aspect of assessment, we recognise the importance of capacity assessment. This is touched upon in Chapter 24 by Betteridge, Cotterill and Murphy but not addressed in detail.

Again, the chapters by Douglas and Togher (Chapter 21) and McDonald and Cassel (Chapter 22) reinforce this view by recommending the use of multi-method approaches to assessing social communication and social cognition skills (use of questionnaires, psychometric tests, behavioural observation or performance-based measures, etc.).

Avoiding biases and other challenges in the evaluation of neuropsychological rehabilitation are discussed in Chapters 43 and 44 respectively.

Neuropsychological rehabilitation relies on the development of a shared understanding of the client's *formulation* and rehabilitation plan, to be shared by the rehabilitation team, the client, the family and any other relevant parties. Ideally, the clinical team prepares the formulation and plan and discusses them with the client and family to solicit their input and approval. Chapter 24 describes a model of behavioural management for community dwellers that relies on frequent input from and agreement with the client, assuring the client understands and takes ownership of the plan at all stages.

As discussed in Chapter 31, fatigue is particularly difficult to assess, both because it can include physiological, emotional and cognitive elements and because no single fatigue assessment tool captures the multifaceted and complex nature of fatigue. Therefore, in treating fatigue, a comprehensive formulation is particularly critical for good management.

### ***Rehabilitation process: intervention***

In many chapters, the focus is on interventions ranging from compensatory approaches for specific neuropsychological impairments (Section Three) to more comprehensive approaches (Section Four).

Neuropsychological rehabilitation includes the teaching of *strategies* and skills, using training methods that facilitate the acquisition and generalisation of skills. The more novel forms of rehabilitation, such as computer-based cognitive retraining and non-invasive brain stimulation (Chapter 34), are directed towards improvement of functions, but the effects are mostly restricted to trained tasks and generalisation to daily life is limited. Ideally these programmes should be offered in combination with comprehensive rehabilitation approaches.

In some cases, such as people with very severe injuries and children, intervention may focus more on management of the environment and on training of the relevant people within the person's environment than on direct teaching of skills and strategies. Such interventions are reflected in the chapters addressing children with brain injury and in Chapters 23 and 24, in which the focus is on people with more severe and challenging behaviours.

An exciting new area of intervention is that of neurologic music therapy (Chapter 33), which has undergone a conceptual shift after early success involving the effect of rhythm on motor control. The new approach, centring on the perception of musical elements, guided the development of a translational clinical model based on music's structural architecture. This model has been successfully applied to cognition, in particular attention, memory, executive function and psychosocial function.

Neuropsychological rehabilitation is ideally based within a *therapeutic milieu* when possible to provide a sense of safety from which the client can then explore the challenging issues of loss and identity. Ownsworth's chapter (Chapter 27) on self-awareness and self-identity highlights how

developing awareness of post-injury changes can pose a threat to people's sense of self. Identity-oriented therapy involves the client and therapist exploring the subjective meaning of post-injury changes to understand how these influence the person's broader self-concept. Through integrated psychotherapy and cognitive rehabilitation approaches people are supported to recognise and accept both changed and stable aspects of self and to learn strategies to manage post-injury impairments. Regular opportunities are needed for clients to apply and generalise positive thinking styles and behaviour to reinforce their renewed sense of identity.

*Psychological therapies* are core to neuropsychological rehabilitation and support the client through the neuropsychological rehabilitation process as well as addressing both traditional targets of psychological input (i.e. anxiety, depression) and transdiagnostic issues (i.e. self-criticism, confidence, identity).

Two chapters on psychological interventions (Chapter 25 by Ownsworth and Gracey and Chapter 26 by Ashworth, Evans and McLeod) review the theory base and evidence for the efficacy of CBT and third wave cognitive and behavioural therapies (Compassion Focused Therapy, Acceptance and Commitment Therapy, and Positive Psychotherapy) in the brain injury field. There is growing evidence that cognitive and behavioural interventions adapted for the brain injury population can improve aspects of psychological well-being that are the primary target of intervention. However, the efficacy of treatment approaches for addressing transdiagnostic issues needs to be determined along with the change mechanisms in therapy.

Neuropsychological rehabilitation is ideally *evidence-based but also innovative*. Clinicians stay abreast of current literature, and interventions are informed by the evidence. However, it is recognised that rehabilitation is both an art and a science, and innovative approaches may be needed. Ideally, these innovations are planned and executed in a way that allows their efficacy to be evaluated.

In Chapter 2 on evidence-based treatment, different forms of treatment evidence in general are discussed, from single case studies, such as single case experimental design (SCED), to group designs and ultimately the randomised controlled trial (RCT). In addition, an overview of the basics of economic evaluation studies are presented, and this is further elaborated in Chapter 38 on the cost-effectiveness of neuropsychological rehabilitation.

Chapter 34 explores efforts to use digital technologies to overcome impairments of both cognitive and emotional difficulties to enable independent activity and encourage greater participation. The chapter conceptualises assistive technology in terms of the specific mental function of the International Classification of Functioning, Health and Disability being assisted.

In Chapter 36 Tsaousides and Ashman describe how advances in technology are changing the ways in which health care is delivered. Telerehabilitation services have the potential to overcome barriers to accessing care and to improve the welfare of individuals affected by neurological disorders. For example, web-based platforms are used to deliver rehabilitation to people who cannot travel the distance to attend nor afford services from specialised professionals. Nonetheless, more research is currently needed to evaluate the clinical efficacy and cost-effectiveness of telerehabilitation formats before these can become an integral part of standard care.

In Chapter 37 Moyle appraises the utility of social robots for enhancing the functioning of older adults, and people with dementia in particular. Over the last decade social robots have been developed to create new opportunities for the person with dementia that may enhance their quality of life. Although further research and ethical guidelines are needed, Moyle predicts that future social and health care will involve the use of robots for monitoring and supporting the care of people with dementia.

### **Rehabilitation goals and outcomes**

Neuropsychological rehabilitation is *goal-driven* from the point of assessment and includes SMART goals and action plans (see Chapter 5). Goals are regularly reviewed and updated.

Neuropsychological rehabilitation is based around *meaningful functional activities* that are relevant to the client. These activities are chosen jointly with the client to the degree possible and are organised hierarchically in order of complexity so that the client experiences success overall.

Neuropsychological rehabilitation bases *results* not on test performance but on gains made in areas chosen by the client to include functional, behavioural, emotional and identity-related goals (see Chapter 5).

These guidelines are reflected in chapters on interventions throughout this book (see, for example, Chapter 34). Another example can be seen in Chapter 22 in which McDonald and Cassel critique earlier laboratory-based training for social cognition, which focused on teaching participants to pass a variant of the Sally–Anne task using methods such as computerised animation with feedback, beliefs as photos or pictures-in-the-head, and thought bubbles. Although these were often effective at training participants to pass this task, they did not generalise to improving performance on novel tasks or real-life situations.

Ideally, trained therapists work in a transdisciplinary way such that client goals are addressed from a multitude of different perspectives. In this way, functional tasks have cognitive strategies, communication skills and mood management entwined in them. The ultimate goal is for clients to achieve a level of understanding and acceptance within the safety of the therapeutic milieu to allow them to test out new ways of thinking and being in their own communities in order to achieve their goals.

In conclusion we wish to say that objectives in any profession are not met by trial and error; they come when members of that profession apply theory to practice, when professional behaviour is informed by theories that they themselves have developed over time. The contributors to this handbook have been instrumental in developing theories that inform clinical practice and rehabilitation advances. The authors bring expertise to this book and international status gained from their clinical work with clients, their academic standing among international colleagues and their publication of reputable research studies.

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### **Further reading**

- Rehabilitation following Acquired Brain Injury: A Headway Review of Guidelines and Evidence*. Available from [www.headway.ie/publications/rehabilitation-following-acquired-brain-injury/](http://www.headway.ie/publications/rehabilitation-following-acquired-brain-injury/) (accessed 1 March 2017).
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