

# Cognitive rehabilitation in multiple sclerosis



CPD 

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## Background

Although cognitive impairment is common and disabling in multiple sclerosis (MS), there are no approved pharmacological treatments for it. Fortunately, there is now good evidence that cognitive rehabilitation is effective in MS. However, most healthcare providers are unaware of these treatment options.

## Objective

The aim of this article is to outline the evidence supporting cognitive rehabilitation in MS.

## Discussion

Often beneficial as a brief cognitive rehabilitation intervention is the psychoeducational feedback session provided after a neuropsychological assessment. Beyond this, more intensive compensatory and restorative cognitive rehabilitation interventions can be effective in MS. Choosing an intervention will depend on the patients' goals, which may range from specific everyday activity/participation goals to preserving existing cognitive functioning by building up cognitive reserve or delaying further cognitive decline by slowing the underlying neurobiological changes. General practitioners can best assist their patients by understanding the treatment options and facilitating their patients' access to the most appropriate cognitive rehabilitation services available.

**COGNITIVE REHABILITATION** can be conceptualised as '... a process whereby people with brain injury work together with health service professionals and others to remediate or alleviate cognitive deficits arising from a neurological insult'.<sup>1</sup> It encompasses a broad range of therapeutic behavioural interventions that draw on knowledge from clinical neuropsychology, behavioural analysis, cognitive retraining, group and individual psychotherapy, theories of compensatory behaviour<sup>2</sup> and concepts of neuroplasticity and cognitive reserve.<sup>3</sup> In its clinical application, cognitive rehabilitation is person-centred: interventions are chosen in close collaboration with the person, based on a thorough biopsychosocial case formulation, and with the aim of meeting the person's key functional, health or quality-of-life improvement goals. The aim of the intervention can be: compensatory, such as finding ways to help a person manage or adapt to their cognitive impairments via the use of external aids or internalised strategies (eg to improve their ability to reliably attend appointments via the use of an external reminder aid or an internalised mnemonic recall strategy); restorative, to strengthen or improve deficient cognitive domains causing disability in everyday life (eg improving specific aspects of memory functioning through cognitive training); or, more likely, a combination of both.

Reviews of the effectiveness of cognitive rehabilitation strategies sometimes group people with multiple sclerosis (MS) with those who have other forms of acquired brain impairment, such as traumatic brain injury, where the groups' stage of life and activity/participation goals might be similar (eg sustaining paid employment or participating in the raising of a family in a busy, noisy household). Alternatively, people with MS are sometimes grouped with those who have other forms of progressive neurological conditions, such as Parkinson's disease, where the focus of the intervention might be to preserve and protect existing cognitive functioning by building up cognitive reserve to delay the functional impact of progressive neurobiological changes.<sup>4</sup> The focus could also be preventive, to lessen or delay any further cognitive decline by slowing down those neurobiological changes;<sup>3</sup> or, more likely, a combination of both preservation and protective interventions.

All forms of cognitive rehabilitation are presumed to work at the neurobiological level via the harnessing of neuroplasticity processes, such as brain activation and increased functional connectivity,<sup>5,6</sup> and possibly by stabilising the brain's network physiology.<sup>7</sup> In addition, in people with MS, beneficial neurobiological changes in the hypothalamic-pituitary-adrenal axis, improved regulation of serotonin

precursors, and neurogenesis are thought to occur when levels of stress and depression are reduced as a result of the improved ability to cope with the disabilities.<sup>8</sup>

### First steps: Clarifying the nature of the cognitive problem and providing initial psychoeducation

Cognitive rehabilitation is best founded on comprehensive biopsychosocial case formation,<sup>2</sup> which includes clarifying the nature and impact of the underlying cognitive impairment. Brief, objective cognitive screening – along with the general practitioner's (GP's) clinical observations, patient's and carer's reports of their concerns and results of psychological screening – may be sufficient to develop an initial treatment plan. Indeed, this screening and consultation process alone is likely to be psychologically therapeutic.<sup>9</sup> However, international guidelines recommend referral for more comprehensive neuropsychological assessment if cognitive impairment, or further cognitive decline, is indicated on screening.<sup>10</sup> Neuropsychological assessment is more thorough and reliable<sup>11</sup> and can provide more detailed information that can be used to develop precise, individually tailored care and treatment plans.<sup>12</sup>

Neuropsychological assessment feedback can be conceptualised as a brief psychoeducational cognitive rehabilitation intervention in and of itself. The therapeutic value of psychological assessment feedback has been long recognised in counselling and clinical psychology assessment settings,<sup>13</sup> and initial evidence supports its value in neuropsychological and cognitive assessment settings.<sup>14,15</sup> Some GPs may have concerns about the potentially harmful psychological consequences to patients of receiving possible 'bad news' (ie confirming cognitive impairment) in the feedback session. However, recent Australian research has shown that adverse outcomes are unlikely to occur when the assessment and feedback are provided by qualified neuropsychologists who are experienced with MS and skilled

in delivering bad news sensitively. This research also showed that despite most patients with MS receiving confirmation of cognitive impairment during the feedback session, one month after the feedback they reported significant improvements in various aspects of their psychological wellbeing, such as improved perception of everyday cognitive functioning, improved confidence in managing the MS, and improved stress and depression.<sup>16</sup> These positive results may have been due to the feedback, including advice about how the person could adjust to, and manage the impact of, any cognitive problems identified, as well as discussion about what other treatments might be useful to pursue, such as more intensive cognitive rehabilitation.

Access to neuropsychological assessment and psychoeducational feedback services in Australia is hampered by the absence of a Medicare Benefits Schedule (MBS) rebate item for the neuropsychological testing component. Nevertheless, the psychoeducational feedback component can be covered by an MBS rebate via a GP Mental Health Care plan if the goal of the assessment is to reduce a client's anxiety or distress about possible cognitive impairment and to improve self-management of their disease. Alternatively, these services can be accessed through private health insurance companies that offer rebates for neuropsychological assessments, hospitals that offer outpatient neuropsychological assessment services (usually requiring a referral from a staff physician) and some community service or ambulatory care organisations. Some people with MS may be able to use their National Disability Insurance Scheme (NDIS) plan funds if the purpose of the assessment and feedback process is to improve their capacity to meet their lifestyle goals; however, even after the NDIS is fully rolled out, only 30% of people with MS are likely to be eligible for funding (for more information refer to the MS Australia website, [www.msaustralia.org.au/about-msa/2019-election-commitments-make-our-stories-matter](http://www.msaustralia.org.au/about-msa/2019-election-commitments-make-our-stories-matter)). On a more positive note, because of the impact of COVID-19 restrictions, many neuropsychological service providers

throughout Australia are now offering their services via telehealth modalities, which may be especially pertinent for GPs working in rural and remote settings.

### Next steps: Choosing between the effective cognitive rehabilitation intervention options

There has been an exponential growth of research in MS cognitive rehabilitation over the past decade that has provided evidence supporting a wide range of compensatory and restorative interventions for treating mild-to-moderate cognitive impairments in MS.<sup>4-7,10</sup> Given that approximately 50% of people with MS experience mild-to-moderate cognitive impairment,<sup>17</sup> these interventions should be routinely considered as treatment options by their GPs.

Practical compensatory interventions, typically delivered by occupational therapists, have long been the preferred rehabilitation approaches used in Australia because of their face validity and practical usefulness, including training in the use of reminder devices to keep track of important tasks and plans, or adjusting workplace environments to reduce distractibility. Recent research supports the effectiveness of these compensatory interventions for people with mild-to-moderate difficulties in attention and memory,<sup>7</sup> although ongoing support or booster sessions might be required until new routines are firmly established. Internalised cognitive skills-based compensatory strategies, usually taught by clinical neuropsychologists, clinical psychologists or speech pathologists, can now also be added to the list of effective options. For instance, three cognitive rehabilitation methods in particular (often used in combination with each other) can improve everyday memory functioning and psychological wellbeing in people with MS: the modified Story Memory Technique,<sup>10,18,19</sup> recommended as a practice standard, and self-generation<sup>10,20-22</sup> and visual imagery,<sup>23-25</sup> both recommended as practice options.<sup>23</sup> The modified Story Memory Technique involves many weeks of training to use context and visual imagery (usually in the form of a

self-created story with vivid, visualised components) to improve associative learning, and therefore retention, of new information. Self-generation involves repetitive, active recall of new information to be learned (rather than passive/silent review of the information) via a type of self-testing process akin to studying intensely for an exam. It is usually paired with a 'spaced retrieval' technique, in which the duration of time between rehearsing the new information and actively recalling it becomes systematically longer to spread out the learning trials as a way of reinforcing and consolidating the new information in memory. Visual imagery involves training in the ability to mentally construct, or reconstruct, scenes and to pay close attention to the details in the mind's eye to improve recall of previous autobiographical memories and future experience possibilities, thus allowing past experiences to guide future behaviours and plans (eg for the nurturing of existing relationships and development of new relationships). All these techniques are effortful but become easier to use with practice. They are best applied in relation to specifically planned, goal-focused learning tasks in real life, such as remembering the face-name pairings of important new people entering the person's extended family or workplace.

Certain restorative approaches may also be effective. Although a detailed discussion of these approaches is beyond the scope of this article, several recent systematic reviews have supported the effectiveness of a range of restorative interventions aimed at improving specific cognitive domains, such as attention, memory and speed of information processing in MS.<sup>5,23,26</sup> Effective interventions tend to be based on the supervised use of computerised cognitive training programs, such as Attention Process Training, RehaCom and Brain HQ.<sup>5,7,26</sup> Some of these computerised interventions can be accessed online, so they should be accessible by people with MS living in rural and remote locations or by those who are unable to travel easily. Many of these interventions have been shown to increase functional connectivity in resting-state brain networks, suggesting that the training may result in greater

neuroplasticity<sup>6</sup> and some protection of cognitive reserve.<sup>4</sup>

Both compensatory and restorative forms of cognitive rehabilitation interventions can improve a patient's everyday cognitive functioning, quality of life, mood and/or coping with cognitive impairments in daily life, not just improve their performance on cognitive tests.<sup>5,6,27,28</sup> For example, a recent Cochrane Review of 44 memory rehabilitation interventions evaluated in randomised controlled trials in MS found that patients who received memory rehabilitation reported better memory functioning and quality of life relative to those who did not receive memory rehabilitation.<sup>29</sup> A number of recent clinical reviews and guidelines about cognitive rehabilitation in MS are available that can be used to guide care and treatment planning.<sup>4,6,7,10</sup>

It is important to note that other 'invisible' MS symptoms (eg fatigue, depression, pain, sleep difficulties) can have an adverse impact on cognitive functioning and therefore may need to be addressed to optimise the outcome of targeted cognitive rehabilitation interventions. Ideally, cognitive rehabilitation for people with MS should occur in a multidisciplinary team setting, where other troublesome MS symptoms are treated at the same time as the cognitive problems in a holistic, integrated manner.<sup>30</sup> For example, 1-4 weeks of inpatient multidisciplinary rehabilitation, including services delivered by clinical neuropsychologists, occupational therapists, clinical psychologists and speech pathologists along with other rehabilitation specialists, can reduce disability and improve cognitive functioning<sup>31</sup> and health-related quality of life for at least a year.<sup>32</sup> One of the benefits of an integrated, multidisciplinary MS rehabilitation service is that patients with cognitive impairment who might not seek cognitive rehabilitation per se because of a lack of insight might nevertheless engage in rehabilitation to meet their physical goals via physiotherapy and occupational therapy and can then also receive cognitive rehabilitation as part of the holistic rehabilitation process. Multidisciplinary rehabilitation in MS is

also good value for money in terms of its cost-effectiveness.<sup>33</sup>

Unfortunately, unlike in many northern hemisphere countries, MS-specific multidisciplinary rehabilitation services (ie teams including cognitive rehabilitation specialists as well as other rehabilitation specialists) are not readily available in Australia; they are not available in most states and territories, and certainly not in rural or remote settings. Fortunately, cognitive rehabilitation as a stand-alone intervention is nevertheless a viable option. Similar to accessing neuropsychological assessment and feedback, the cost of accessing this type of service via a private practitioner can be subsidised by an MBS rebate linked to a GP Mental Health Care plan if the goal of therapy is to improve the patient's psychological wellbeing and coping skills. Some cognitive rehabilitation therapists offer their services on a hospital outpatient basis, or the cost may be borne by private health insurance. Alternatively, some people with MS may be able to use their NDIS funds to cover this expense if the primary purpose of cognitive rehabilitation is to build their capacity to meet their lifestyle goals.

### Future directions

Research findings that support the effectiveness of cognitive rehabilitation in MS continue to advance at a rapid pace, and the results are encouraging. Cognitive rehabilitation is a relatively low-cost and low-risk intervention; patients typically report enjoying it, and because of the lack of approved pharmacological treatments, it is the best option to treat cognitive impairment in MS.<sup>6</sup> The National MS Society of USA now recommends the use of cognitive rehabilitation as a part of a comprehensive treatment plan for people with MS, and provides detailed clinical guidelines as to when and how to apply various interventions.<sup>10</sup> In Australia, the biggest barrier to people with MS accessing effective treatment of their cognitive impairments is the lack of knowledge among healthcare providers and MS advocacy organisations about these evidence-based MS-specific cognitive

rehabilitation approaches. Another barrier is finding appropriately qualified and experienced cognitive rehabilitation practitioners to deliver these interventions. Although the clinical neuropsychologists, clinical psychologists, occupational therapists and speech therapists who offer assessments for people with MS will usually also be able to provide recommendations to GPs about cognitive rehabilitation practitioners available locally, none of the publicly available national or state/territory allied health practitioner lists provides information about practitioners' skills and experience in cognitive rehabilitation on a more easily accessible, wider scale.

Given the above, there is a pressing need to develop a set of national clinical practice guidelines for the early detection, management and rehabilitation of cognitive impairment in MS that incorporates this new evidence. There is also a need to develop publicly available lists of appropriately skilled cognitive rehabilitation practitioners who are able to deliver these interventions. These actions would go some way to ensuring that Australian GPs can assist people with MS with cognitive impairments to gain prompt access to the very best evidence-based treatments available.

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