

Cognitive Assessment during a Course of Electroconvulsive Therapy - A National Questionnaire Survey of Current Practice in Aotearoa, New Zealand

Anneke Thornton, Janet Leathem and Ross Flett

School of Psychology, Massey University, New Zealand

Objective: To shed light on current practice regarding cognitive assessment during electroconvulsive therapy (ECT) across Aotearoa.

Design/Participants: 24 medical professionals representing all ECT administering district health boards responded to an electronic questionnaire.

Results: 73.7% assess cognitive function at least once during a course of ECT. 27.3% assess at baseline, at least once during the course and again post-treatment. Assessments are primarily conducted by nurses (38.8%), psychiatrists (22.2%) and psychologists (22.2%). 66% of respondents reported cognitive assessment was not conducted frequently or thoroughly enough in their workplace due to a lack of time, resources and sensitive tests.

Conclusion: Respondents recognised assessing cognitive change during a course of ECT was important, though large variations in the nature, frequency and length of assessments existed. Future research should focus on the development of a sensitive screening measure tailored for use with patients receiving ECT to help overcome the current restrictions to cognitive assessment.

Keywords: cognitive assessment, current practice, Electroconvulsive therapy.

This study received ethical approval from the Health and Disability Ethics Committee, New Zealand.

Electroconvulsive therapy (ECT) is an effective treatment for a variety of psychiatric disorders (Mankad, Beyer, Weiner, & Krystal, 2010). It is fast acting and often effective when all other treatments have failed. Up to 50-60% of people who are non-responsive to medication will show clinical improvement from ECT (Prudic et al., 1996). Despite high treatment efficacy, ECT is only prescribed in New Zealand, as in other parts of the western

world, under strict conditions (Ministry of Health, 2004). Central to these restrictions are ongoing reports that ECT may cause cognitive impairment (Ingram, Saling, & Schweitzer, 2008; Nehra, Chakrabarti, Sharma, & Painuly, 2007). In addition, cognitive side effects limit the use of ECT by diminishing patient satisfaction and contributing to the stigma associated with the treatment (Prudic, 2008). Cognitive assessment during the treatment course

is recommended in order to detect and monitor cognitive change (Nehra et al., 2007).

Of the 20 district health boards (DHBs) in New Zealand, ECT was administered at 15 at the time this survey was conducted. The most recent statistics on the number of patients receiving ECT in New Zealand are from 2011, and reveal 286 patients received ECT during this year; 6.5 people per 100,000 (Ministry of Health, 2012). ECT is prescribed as a course of treatments and typically involves six to 12 individual treatments of ECT (MOH; Ministry of Health, 2009). The number of treatments a person may have will depend on the severity of illness and degree of treatment resistance, degree of complicating medical factors, the person's age (elderly patients may require longer courses) and technical parameters such as whether the ECT is administered bilaterally or unilaterally (Ministry of Health, 2012). In New Zealand no regulations exist which oblige treating professionals to monitor or assess cognitive functioning. As there are no enforced guidelines put in place to assess cognitive function, it is unclear what practitioners are doing to assess cognitive function and whether or not practitioners have sufficient resources to do so. The aim of the current study is to

shed some light onto what practitioners around the nation are doing at assess cognitive change during a course of ECT.

Recommendations and Guidelines for ECT Cognitive Assessment

Although there are no strict guidelines around how cognition should be assessed in New Zealand, various national and international organisations have recommended a patient's cognitive functioning is monitored intermittently throughout ECT (Porter, Douglas, & Knight, 2008). See for example, The ECT Accreditation Service (The Royal College of Psychiatrists Centre for Quality Improvement, 2011), the National Institute of Clinical Excellence (National Institute of Clinical Excellence, 2003), the American Psychiatric Association (American Psychiatric Association, 2001), and the Royal Australian and New Zealand College of Psychiatrists (Royal Australian and New Zealand College of Psychiatrists, 1999).

Suggestions for assessment schedules and batteries also exist within the peer-reviewed literature. Porter and colleagues (2008) offer number of useful recommendations: a) to conduct a baseline assessment, reassess early in treatment, and again after the sixth treatment; b) to carry out assessments at a standard time after treatment which should be at least 48 hours post treatment to allow for any transient treatment effects to resolve; c) repeat the same battery 2-3 months post treatment; d) and to include a mood measure alongside the cognitive assessment as mood affects cognitive performance. Porter and colleagues proposed a 55 minute test battery including the MMSE or 3MSE, Hopkins Verbal Learning Test (HVLT; Brandt, 1991), Autobiographical Memory Questionnaire- Short Form (AMI-SF; Kopelman, Wilson, & Baddely, 1989) and the Digit-symbol Substitution Task (DSST; Wechsler, 1997). A brief cognitive battery has recently been suggested by Viswanath et al., (2013) which offers an ECT battery appropriate for use in developing countries where the number of patients receiving ECT per day is high (10-15 treatments)

and resourcing is low. The battery is short (20-30 minutes) and is culturally adapted for use in the Eastern world.

Within the aforementioned national, international and academic guidelines, some common themes emerge: a) the need for frequent and ongoing monitoring of a patient's cognitive functioning; b) the importance of a baseline assessment of cognitive functioning prior to commencing ECT to obtain a benchmark for cognitive change; c) the MMSE is the most commonly recommended cognitive screen but is potentially problematic; d) a report of subjective memory function should also be obtained, and e) a patient's clinical state should be assessed alongside their cognitive function. The recommendations are not clear regarding where the responsibility for doing the cognitive assessments lies (except for ECT Accreditation Service who explicitly state that the onus is on the referring psychiatrist). Another common trend is the inclusion of the Mini Mental Status Examination in the guidelines and suggested batteries, despite research suggesting that short cognitive screening measures such as the MMSE are problematic as they are insensitive in detecting ECT related cognitive change (Robertson & Pryor, 2006).

Benefits of Cognitive Assessment during Electroconvulsive Therapy

Since the introduction of ECT in 1938, efforts have been made to refine the ECT administration technique to increase clinical efficacy and reduce the cognitive side effects of the treatment (Abrams, 2002). Despite these efforts, cognitive impairment remains a common and unwanted side effect (Ingram et al., 2008). The most severe, well researched and distressing cognitive side effect of ECT, however, is its negative impact on memory (Sackeim et al., 2007; Sienaert, 2010; Sobin et al., 1995). Patients can experience difficulties with the speed in which they are able to process information, their ability to sustain attention, to plan, organise and mentally shift between tasks, their visuospatial skills can become impaired as can general intellect (Ingram et al., 2008). These changes are often subtle, and are

not easily detected by brief cognitive screens such as the MMSE (Robertson & Pryor, 2006).

Switching from sine-wave to brief-pulse electrical stimulation in the 1980s was one refinement to ECT which relieved the severity of cognitive impairment (Weiner et al., 1990). Since this change, research concludes that cognitive dysfunction is less severe and mostly limited to the first three days post treatment. After 15 days most dysfunction should have resolved (Semkovska & McLoughlin, 2010). Descriptive reviews agree that six months post treatment, all ECT related cognitive dysfunction should have resolved (Calev, 1994; Ingram et al., 2008). If this is the case, then why should medical professionals bother spending valuable time and resources assessing cognition? The motivation to do so derives from the fact that some patients report significant gaps in their memory years after treatment (Rose, Fleischmann, Wykes, Leese, & Bindman, 2003). Monitoring a patient's cognitive functioning throughout their course of ECT allows for the detection of impairment early on in treatment, and impairment early on in treatment may pose as a risk factor for continual cognitive decline as the treatment course progresses (Porter et al., 2008).

If impairment can be identified, parameters of ECT administration can be altered, or if necessary, the treatment course can be suspended (Scott, 2010) or terminated (Porter et al., 2008). Modifications which are well documented to reduce cognitive impairment include: changing from bilateral to unilateral ECT, decreasing intensity of electrical stimulation, spacing of treatments from more to less frequent and altering dosages of medications and anaesthetics where possible (Scott, 2004). Treatment planning should aim to maximise clinical efficacy while minimising adverse cognitive side effects.

In summary, the benefits of regularly assessing cognitive function are evident. Guidelines around how and when to assess cognition during the course of ECT do exist, but thorough and frequent assessments are said to be rare (Porter et al., 2008). Current practice around

cognitive assessment during ECT has not yet been evaluated in Aotearoa, New Zealand. The aim of this study is to investigate what medical professionals are doing to assess cognition for patients undergoing a course of ECT in New Zealand. The frequency and length of assessments, domains of cognition assessed and measures used will be described. We consider who is conducting the assessments, and what barriers, if any, limit more frequent or thorough assessments from occurring in New Zealand hospitals.

MethodParticipants

Respondents were psychiatrists, nurses, and psychologists across ECT administering DHBs throughout New Zealand. Only health professionals working with individuals receiving ECT or involved in the monitoring of cognition with these individuals were invited to respond to the questionnaire. Of the 20 DHBs in New Zealand, 15 were performing ECT at the time the questionnaire was sent out. At least one response was received from each ECT administering DHB in New Zealand. When completed questionnaires reported a common method of assessment within the same DHB only one questionnaire was included in the analysis. A total of 24 completed questionnaires were analysed. The DHBs and number of responses are as follows: Auckland DHB (2), Capital and Coast DHB (2), Mid Central DHB (1), Waikato DHB (5), Canterbury DHB (2), Taranaki DHB (1), Counties Manukau DHB (2), Southern DHB (3), Northland DHB (1), Hutt Valley DHB (1), Bay of Plenty DHB (1), Hawke's Bay DHB (1), Lakes DHB (1), and Nelson-Marlborough DHB (1).

Procedure and Questionnaire Design

An email was sent out to a National ECT treatment staff email list which included a link to the electronic questionnaire and information introducing the questionnaire. The mail list included ECT administering psychiatrists, ECT nurses and other treating professionals such as prescribing psychiatrists. The questionnaire was sent to all 45 individuals on this mail list, of the 45 approached, 18 completed

the electronic questionnaire. The questionnaire was then sent out to a further 8 people to ensure coverage across all ECT administering DHBs was achieved. Three reminders were sent over a six month period. The questionnaire took approximately 10 minutes to complete, and explored the following areas: measures in place for assessing cognition within their service, whether a measure of clinical state is included within the assessment, who is responsible for conducting the assessments, timing of assessments, frequency of assessments, and whether, in the opinion of the respondent, patients' cognitive functioning was assessed frequently enough, and if not, what restricted the occurrence of more frequent or thorough cognitive assessments. The results of the questionnaire remained anonymous and respondents had the opportunity to not respond to items if they were unaware of the answer. The responses to the survey were collected from October, 2012 until June, 2013. The survey was generated using Qualtrics.TM

Results

The data were analysed using Statistical Package for Social Sciences (SPSS) Version 19.0. One DHB has a data analyst responsible for conducting all cognitive assessments; all responses received from this DHB but were treated as one response as they all reported answers based on a common system of assessment.

How frequently is Cognition Assessed?

Most respondents (75%, N=18)

reported that some form of cognitive assessment is conducted during a course of ECT. Of these, 29.2% (N=7) conduct an assessment prior to ECT, at least once during the course and again after the course. Around 46% (N=11) reported that a baseline cognitive assessment is routinely conducted, and half conduct an assessment post treatment. One respondent (4.5%) reported cognitive assessments were only conducted in their DHB if the patient complained of memory impairment post ECT. Approximately 66.7% (N=16) stated that assessment of cognitive functioning is currently not being carried out frequently enough. Factors contributing to the prevention of more frequent thorough cognitive assessments included: lack of time (100%), lack of resources (50%, N=12), and a lack of suitable screening measures sensitive to ECT related cognitive impairment (41.6%, N=10).

Which Assessment Measures are being utilised?

Figure 1 illustrates these findings. The most frequently used cognitive assessment measure is the MMSE. Also popular is the Montreal Cognitive Examination (MoCA; Nasreddine et al., 2005) and the Addenbrooke's Cognitive Examination-Revised (ACE-R; Mioshi, Dawson, & Mitchell, 2006). Some respondents reported using the measures suggested by Porter et al. (2008) which includes the HVLT, AMI-SF, DSST in addition to the MMSE or the 3MSE. Over a third of respondents (37.5%, N=9) use more than one measure to assess cognitive functioning.

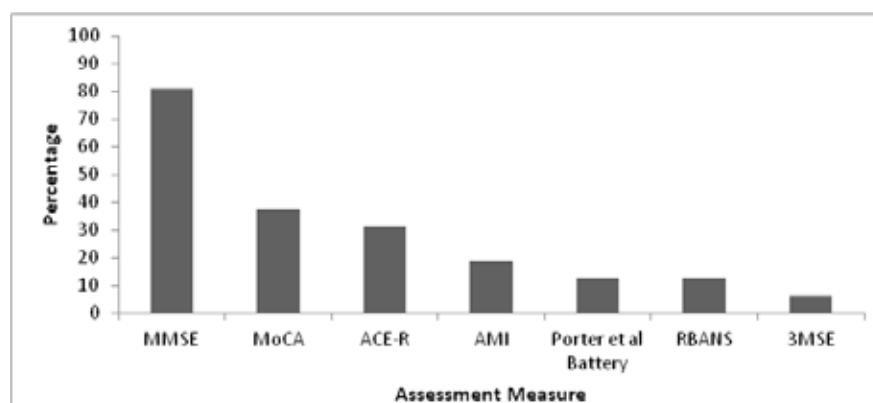


Figure 1. Frequency of assessment tools used to assess cognitive functioning.

Assessing Clinical State during ECT

Most practitioners are conducting a mood assessment alongside the cognitive assessment (83.3%, N=20). The most commonly utilised assessment measure is the MADRS (54.2, N=13%), less commonly utilised are the BDI-II (8.3%, N=2) and the Geriatric Depression Scale (8033, N=2%). The Hamilton Depression Rating Scale and the Hospital Anxiety and Depression Scale are also used with people receiving ECT. Many practitioners (37.5%, N=9) also assess anxiety and psychosis as well as mood alongside the cognitive assessment.

Who Conducts the Assessment?

The majority of the cognitive assessments are conducted by nurses (37.5%, N=9). Many of the assessments are also conducted by psychiatrists (20.8%, N=5) and clinical psychologists (20.8%, N=5). A small minority of assessments are conducted by junior doctors/ registered medical doctors (16.7%, N=4) and data analysts (4.2%, N=1).

How Long is Spent Conducting the Cognitive Assessment?

The average reported time spent conducting cognitive assessments with patients was 23 minutes, with large variation between respondents (SD=16.8). Typically, 10 minutes (45.8%, N=11) is spent conducting assessments, or 20 minutes (20.8, N=5%). One third of respondents reported spending 30 minutes to one hour conducting the assessment (N=8). When asked how long an ideal cognitive screen should take, respondents reported on average, 17 minutes (SD=8.26) would be feasible. Cognitive assessments are generally being conducted 24 hours post treatment (41.7%, N=10), however, many respondents also report conducting assessments one to five hours (20.8%, N=5), 48 hours (29.2%, N=7) and a few days to one week post treatment (8.3%, N=2).

Discussion

Medical professionals in this sample

recognise that cognitive assessment is an integral component of treatment with ECT. Most respondents report that a cognitive assessment is conducted at least once during a patient's course of ECT. Almost one third of the respondents reported that some form of cognitive assessment is conducted pre and post treatment and at least once during the course. Most of the cognitive assessments are augmented with a mood assessment; the MADRS is the most commonly used tool for this. This is beneficial in assessing ECT efficacy for the individual, and to gauge the effect of mood on cognitive function. Timing of the assessments varies; however, most are conducted at least 24 hours post treatment. The time spent conducting the assessment is often brief, around 10-20 minutes. In New Zealand, cognitive assessments are being conducted by nurses, psychologists, psychiatrists, doctors and data analysts. Many respondents reported that monitoring of cognition is hampered by lack of time, resources and appropriate sensitive measures of cognitive change. Some respondents have adopted Porter et al.'s (2008) recommended battery of tests, but a lack of time and resources restrict many from carrying out this 55 minute long assessment. The MMSE was the most commonly utilised measure of cognitive functioning. The MMSE is often recommended within the ECT guidelines around cognitive assessment and is a popular brief cognitive screening tool in New Zealand (Strauss, Leatham, Humphries, & Podd, 2012); however, has been found to be insensitive to detecting ECT related cognitive change (Robertson & Pryor, 2006).

Implications

Due to the insensitivity of current measures being used to assess cognitive function during ECT, or the lack of time professionals have to administer more sensitive measures, we argue that there is a need for the development of a new cognitive screening measure. Alternatively, the battery proposed by Viswanath et al., (2013) could be adapted for use in Western countries. The results of the current study inform that an ECT cognitive screen would need to take fewer than 20 minutes to administer, as time was the largest factor preventing cognitive assessment. The

measure would need to be inexpensive and be sensitive to detecting ECT related cognitive change and have sound psychometric properties. As it is optimal that cognition is reassessed throughout a course of ECT, a screening measure with alternate forms would prevent practice effects. As assessments are being carried out by a wide range of professions, the assessment instrument would need to be easy to administer and score and require minimal training.

As a screening measure will take time to develop and validate, in the interim, the Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005) could be utilised as an alternative to the MMSE. The MoCa may be more sensitive than the MMSE when assessing the long term cognitive effects of ECT (Luther, 2012). The MoCa is a one page 30 point test which takes approximately 10 minutes to administer. The MoCa assesses short term memory, visuospatial abilities, executive functioning, attention, abstraction, orientation, concentration, working memory, language, short term memory recall and delayed recall after approximately five minutes. The MoCa has superior sensitivity (90%) and specificity (87%) for detecting MCI, compared with 18% and 100% respectively for the MMSE (Nasreddine et al., 2005). The MoCa is available free in the public domain and has three alternate forms.

Although the MoCA has been shown to be more sensitive to cognitive change during ECT than the MMSE (Luther, 2012), as with the MMSE, the MoCA was designed to detect dementia related mild cognitive impairment, not ECT related cognitive change. A screening measure should not be used as a direct proxy to more sophisticated assessments such as Porter et al.'s (2008) suggested battery, however, when only a short time frame is permitted, the use of the MoCA has been shown to be superior to the MMSE and certainly to an absence of cognitive assessment.

A further implication which emerged from this small sample of health professionals working with individuals receiving ECT there was high variability in the way in which cognition was assessed. Even within good practice guidelines,

recommendations for assessment during ECT vary. There appears to be a need for a standardised method of cognitive assessment which would accommodate the time restrictions imposed upon health professionals but would also provide a measure of cognitive function in individuals receiving the treatment. The recommendations offered within Porter and Douglas' (2008) article provide a good starting point for this.

Limitations

The greatest limitation of the current study was the small sample size and the exclusion of responses from non government organisations which perform ECT. This limits the generalisability and representativeness of the results. The way in which respondents were recruited may have also limited the representativeness of the results, as the email list from which the majority of respondents were recruited likely only included a subsample of individuals working with this population.

Although respondents were asked to comment on the nature of cognitive assessment during ECT within their service in which they worked, this does not capture intra-service variability within a district health board, particularly in the larger DHBs such as Waikato. In addition, as completion of the questionnaire was voluntary, there may have been a response bias such that the reported frequency of cognitive assessments may be inflated and the numbers of people not conducting cognitive assessments may be higher than reported due to giving a socially desirable response.

Despite these limitations, the current investigation provided a glimpse into current practice of cognitive assessment during ECT among 24 services within Aotearoa's DHBs; information which previously remained largely unknown for New Zealand. Future research should address the dearth of appropriate, sensitive and brief measures tailored for the assessment of cognitive change during electroconvulsive therapy.

The authors would like to acknowledge Dr Nisar Contractor for his assistance in recruiting respondents for this questionnaire.

References

- Abrams, R. (2002). *Electroconvulsive Therapy*. New York: Oxford University Press.
- American Psychiatric Association (Ed.). (2001). *The practice of ECT: Recommendations for treatment, training and privileging* (2 ed.). Washington, DC: American Psychiatric Press.
- Brandt, J. (1991). The Hopkins verbal learning test: Development of a new memory test with six equivalent forms. *Clinical Neuropsychology*, 5, 125-142.
- Calev, A. (1994). Neuropsychology and ECT: Past and future research trends. *Psychopharmacology Bulletin*, 30, 461-469.
- Ingram, A., Saling, M., & Schweitzer, I. (2008). Cognitive side effects of brief pulse electroconvulsive therapy: A review. *Journal of ECT*, 24(1), 3-9.
- Kopelman, M. D., Wilson, B. A., & Baddely, A. D. (1989). The Autobiographical Memory Interview: A new assessment of autobiographical and personal semantic memory in amnesic patients. *Journal of Clinical Experimental Psychology*, 11, 724-744.
- Luther, K. M. (2012). *Objective and subjective assessment of the cognitive outcomes of electroconvulsive therapy: A brief review*. Doctorate in Clinical Psychology Thesis by Publication, Massey University, Wellington.
- Mankad, M. V., Beyer, J. L., Weiner, R. D., & Krystal, A. D. (2010). *Clinical Manual of Electroconvulsive Therapy*. Arlington, VA: American Psychiatric Publishing.
- Ministry of Health. (2004). *Use of electroconvulsive therapy (ECT) in New Zealand: A review of efficacy, safety, and regulatory controls*. Ministry of Health, New Zealand.
- Ministry of Health. (2009). *Electroconvulsive Therapy (ECT) in New Zealand - What you and your family and whānau need to know*. Wellington: Ministry of Health.
- Ministry of Health. (2012). *Office of the director of mental health: Annual Report 2011*. Wellington: Ministry of Health.
- Mioshi, E., Dawson, K., & Mitchell, J. (2006). The Addenbrooke's Cognitive Examination Revised (ACE-R): A brief cognitive test battery for dementia screening. *International Journal of Geriatric Psychiatry*, 21, 1078-1085.
- Nasreddine, Z. S., Phillips, N. A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., . . . Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, 53(4), 695-699. doi: 10.1111/j.1532-5415.2005.53221.x
- National Institute of Clinical Excellence. (2003). *Guidance on the use of electroconvulsive therapy: Technology appraisal 59*. London.
- Nehra, R., Chakrabarti, S., Sharma, R., & Painuly, N. (2007). Can mini mental state examination (MMSE) scores predict short-term impairments in memory during electroconvulsive therapy (ECT)? *German journal of Psychiatry*, 10, 8-12.
- Porter, R., Douglas, K., & Knight, R. (2008). Monitoring of cognitive effects during a course of electroconvulsive therapy: Recommendations for clinical practice. *Journal of ECT*, 24(1), 25-34.
- Prudic, J. (2008). Strategies to minimise cognitive side-effects with ECT: Aspects of ECT technique. *Journal of ECT*, 24, 46-51.
- Prudic, J., Haskett, R. F., Mulsant, B., Malone, K. M., Pettinati, H. M., Stephens, A., . . . Sackeim, H. A. (1996). Resistance to antidepressant medications and short term clinical response to ECT. *American Journal of Psychiatry*, 153(8), 985-992.
- Robertson, H., & Pryor, R. (2006). Memory and cognitive effects of ECT: Informing and assessing patients. *Advances in Psychiatric Treatment*, 12, 228-238.
- Rose, D., Fleischmann, P., Wykes, T., Leese, M., & Bindman, J. (2003). Patients' perspectives on electroconvulsive therapy: Systematic review. *British Medical Journal*, 326(7403), 1363. doi: 10.1136/bmj.326.7403.1363
- Royal Australian and New Zealand College of Psychiatrists. (1999). *Guidelines for the administration of electroconvulsive therapy*. Clinical Memorandum 12. Carlton: Blackwell Science Asia.
- Sackeim, H. A., Prudic, J., Fuller, R., Keilp, J., Lavori, P. W., & Olfson, M. (2007). The cognitive effects of electroconvulsive therapy in community settings. *Neuropsychopharmacology*, 32(1), 244-254. doi: 10.1038/sj.npp.1301180
- Scott, A. I. F. (2004). *The ECT Handbook (Second edition): The Third Report of the Royal College of Psychiatrists' Special Committee on ECT*. Royal College of Psychiatrists: London.
- Scott, A. I. F. (2010). Electroconvulsive therapy, evidence and practice. *British Journal of Psychiatry*, 196, 171-172. doi: 10.1192/bjp.bp.109.074054
- Semkovska, M., & McLoughlin, D. M. (2010). Objective cognitive performance associated with electroconvulsive therapy for depression: A systematic review and meta-analysis. *Biological Psychiatry*, 68(6), 568-577. doi: 10.1016/j.biopsych.2010.06.009
- Sienaert, P., Vansteelandt, K., Demyttenaere,

- K., Peuskens, J. (2010). Randomized comparison of ultra-brief bifrontal and unilateral electroconvulsive therapy for major depression: cognitive side-effects. *Journal of Affective Disorders*, 122(1-2), 60-67.
- Sobin, C., Sackeim, H. A., Prudic, J., Devanand, D. P., Moody, B. J., & McElhiney, M. C. (1995). Predictors of retrograde amnesia following ECT. *The American Journal of Psychiatry*, 152(7), 995-1001.
- Strauss, H. M., Leathem, J., Humphries, S., & Podd, J. (2012). The use of brief screening instruments for age related cognitive impairment in New Zealand. *New Zealand Journal of Psychology*, 41(2), 11.
- The Royal College of Psychiatrists Centre for Quality Improvement. (2011). *The ECT Accreditation Service* (9th ed.). London: The Royal College of Psychiatrists.
- Viswanath, B., Harihara, S. N., Nahar, A., Phutane, V. H., Taksal, A., Thirthalli, J., & Gangadhar, B. N. (2013). Battery for ECT Related Cognitive Deficits (B4ECT-ReCoDe): Development and validation. *Asian Journal of Psychiatry*, 6(3), 243-248. doi: 10.1016/j.ajp.2012.12.010
- Weiner, R. D., Fink, M., Hammersley, D. W., Small, I. F., Moench, L. A., & Sackeim, H. A. (1990). American Psychiatric Association Task Force Report on Electroconvulsive Therapy. Washington DC: American Psychiatric Association.
- Wechsler, D. (1997). *The Wechsler Adult Intelligence Scale - III*. San Antonio, TX: The Psychological Corporation

Address for correspondence:

Anneke A. Thornton,
C/O Janet Leathem,
Massey University
Psychology Clinic,
King Street,
PO Box 756, Wellington, 6140,
New Zealand.
Phone 0064 4 8015799 extn
62528,
Fax 64 4 8010493.
Email anneke_thornton@hotmail.
com

Conflicts of interest:

None declared.

Copyright of New Zealand Journal of Psychology is the property of New Zealand Psychological Society and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.

Cognitive assessment during a course of electroconvulsive therapy - A national questionnaire survey of current practice in Aotearoa, New Zealand

Thornton A

2014-07-01