A Review of Continuation and Maintenance Electroconvulsive Therapy

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**Background:** Many patients with major psychiatric disorders who are severely ill, medication-resistant, or medication-intolerant respond more reliably and quickly to a course of electroconvulsive therapy (ECT). The management of such patients after successful treatment with ECT is of significant importance given the high rate of relapse and recurrence of these disorders. The unmet clinical need to maintain the mental health of these seriously ill patients at an optimal level has revived the interest in ECT as an alternative prophylactic treatment.

**Method:** We review the historical background of ECT and the literature that supports its use as a prophylactic treatment in various disorders and special populations. A clinical summary outlining its efficacy, acceptability, risks, cost-effectiveness, and medicolegal aspects is followed by a guide for prescribing ECT for prophylactic reasons.

**Results:** Continuation and maintenance ECT (C/MECT) has been found to be efficacious, safe, well tolerated, and cost-effective. Its greatest impact has been in reducing relapse, recurrence, and rehospitalization, particularly in the management of recurrent mood disorders in the elderly. The elderly are usually refractory or intolerant to pharmacotherapy but have a good response to ECT during the index episode. Parkinson’s disease (PD), schizophrenia, and obsessive–compulsive disorder (OCD), as well as affective disorders coexisting with dementia, neurological disorder, or mental retardation, have also been reported to respond to C/MECT. The outcome depends greatly on rate of compliance. Cognitive risks of C/MECT need to be further studied because the literature to date consists mostly of case reports and anecdotal evidence. Controlled studies with well-defined outcome measurements are needed.

**Conclusions:** When planning a rational approach to the care of patients with major psychiatric disorders, clinicians should carefully consider ECT along with other alternatives.

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**Key Words:** electroconvulsive therapy, continuation electroconvulsive therapy, maintenance electroconvulsive therapy, prophylactic electroconvulsive therapy, treatment resistance, medication intolerance, mood disorders, depression, Parkinson’s disease, schizophrenia, obsessive–compulsive disorder, reversible dementia, elderly, mentally disabled

The practice of ECT is firmly established as an effective and safe treatment for acute episodes of severe major depression and other mental disorders (1,2). Although its efficacy for such acute episodes is unchallenged, ECT is frequently discontinued once it is proven to be effective, that is, after the acute symptoms have remitted (3). The major psychiatric disorders are chronic and recurring illnesses, and the continuation of treatment beyond the acute phase is important to good management (4). The 1985 National Institute of Mental Health consensus statement on pharmacologic prevention of mood disorders (5) found that the means to alleviate the acute symptoms of affective disorders were further ahead than maintenance and continuation strategies. Following an acute course of ECT, prevention of a “relapse” (symptoms of the index episode) and prevention of “recurrence” (symptoms from a subsequent new episode) (6) are frequently sought from medications that had proved ineffective before the administration of ECT. The notion of prophylactic treatment is readily and widely applied to pharmacotherapy but often not to ECT. A high relapse rate following a
course of ECT is therefore a function of inadequate planning for long-term management.

Continuation ECT (CECT) is a time-limited course of treatments (≤ 6 months) that follows an index course intended for relapse prevention; in contrast, maintenance ECT (MECT) has no fixed endpoint, and its purpose is to prevent recurrence of separate episodes of the illness (7). In this paper, when we refer to either CECT or MECT, the abbreviation “C/MECT” will be used. This article will critically examine the relevant literature and provide some clinical guidelines for the use of ECT beyond the acute phase of illness, that is, as a prophylactic treatment.

Historical Review

In the years shortly after ECT was introduced, continuing it to maintain patients on the treatment beyond the acute phase of the illness was customary. MECT was first described soon after its discovery and was used to control psychotic symptoms in schizophrenia beyond the point of immediate relief (8). By treating at the first signs of relapse, Moore (9), by trial and error, developed an optimal monthly schedule of ECT for 56 schizophrenic patients. Of 300 hospitalized patients treated with MECT by Kerman (10), 201 (67%) were easier to manage and were eventually discharged, having attained a higher level of functioning than before ECT.

In 1949, Canadians Geoghegan and Stevenson (11) reported on one of the earliest controlled studies on MECT. They treated 13 patients with a recurrent mental illness, defined as “two or more attacks in five years,” with a monthly “electric convulsion” prophylactically. Before the prophylactic treatment, these patients suffered 2 or more illness “attacks” in the previous 5 years but remained “entirely free of attacks” during the 3-year prophylactic period (11, p 494). In contrast, a group of 11 patients with similar previous histories who declined the prophylaxis each had one or more attacks during the same 3-year period. Two patients who cooperated well for the first 2 years but subsequently decided to stop treatment each had recurrence of an attack within 9 months of stopping the treatment.

Bourne (12) proposed a theory of “convulsion dependence” similar to insulin dependence as a rationale for continuing patients on ECT after recovery from acute symptoms. Wolff (13) treated 505 female patients suffering from organic brain syndromes, the majority of whom were over age 60, with weekly to monthly ECT for up to 3 years. He noted substantial remission with decreased agitation, improved appetite, and a reduction in relapse and rehospitalization rates for up to 18 months during the treatment period. The introduction of psychotropic medication in the late 1950s, with the belief that it would replace ECT, coupled with heightened public emotion and concern, led to the diminution in the use of MECT over the next several years (14).

Occasional case reports of MECT continued to appear in the literature in the 1960s. Hastings (15) and Holt (16) reported on one and 2 cases, respectively, of poor medication responders who “markedly improved” during MECT for up to 5 years. Karliner and Wehrheim (17) offered monthly ECT to 210 patients with a recurrent psychotic episode who had responded well to ECT: 57 of the patients accepted the therapy. During the next 6 years, those who participated had a relapse rate of 12% compared with a 79% relapse rate in the group that refused MECT. In a 25-year summary of his experience, Karliner (18) outlined how 132 patients 19 to 83 years old had far fewer relapses with MECT (10%) compared with a matched control group receiving pharmacotherapy (79%); generally, the older patients in the MECT group did better.

In the last decade, as limitations of optimal pharmacotherapy became evident, the need to prevent relapses and recurrences in very ill, melancholic, delusionaly depressed, suicidal, or manic patients became more urgent, rekindling interest in C/MECT. In a 1985 survey of 86 psychiatrists with a special interest in ECT, Kramer (19) found that 60% had employed ambulatory maintenance ECT in the treatment of their patients. This survey, along with Fink’s editorial (24), was rapidly followed by 20 reports describing 150 subjects from 16 medical centres, each emphasizing the efficacy of ECT in maintaining the mental health of certain patients. Within this milieu, the American Psychiatric Association Task Force on ECT delivered its Special Report (7), in which it recognized the role of C/MECT in the management of a patient’s post-ECT course. The recent task force report on ambulatory ECT by the Association for Convulsive Therapy (20) further defines the role of ambulatory ECT as both an acute and a continuation—maintenance treatment for selected patients.

The Use of C/MECT in Other Diagnostic Groups

Recurrent Mood Disorders

The literature on recurrent mood disorders forms the bulk of evidence in support of C/MECT and is summarized in Table 1 (21–34). It strongly suggests that patients with highly recurrent, relapsing, treatment-refractory mood disorders who have responded to an index course of ECT are suitable candidates for C/MECT.

Bipolar Affective Disorders

Most studies that involved treating bipolar patients with MECT, including rapid cyclers, have been very encouraging (23–25,31,33,34). Some authors have raised the concern that treating bipolar patients with both standard and maintenance ECT may induce a switch from depression to mania or vice versa. Small and others (35) reported 2 such cases and discussed complications such as concomitant medication use, technical aspects of ECT, regulatory aspects, and possible
### Table 1. Studies on treatment of recurrent mood disorders with C/MECT

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample size/diagnosis</th>
<th>Average age (years)</th>
<th>Methods</th>
<th>Outcome</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decina 1987</td>
<td>N = 3; 1 UPD, 1 BPD, 1 SAD</td>
<td>56</td>
<td>CECT q 10 to 30 days for 3 to 6 months; average 7 BL ECTs/6 months</td>
<td>2 compliant cases did well; 1 noncompliant case relapsed</td>
<td>CECT prevents early relapse of MDD after index ECT</td>
</tr>
<tr>
<td>Loo 1988</td>
<td>N = 4; NA</td>
<td>72</td>
<td>Patients known to have high recurrence rate given MECT</td>
<td>Relapse-free for 8 to 18 months</td>
<td>MECT prevents recurrence</td>
</tr>
<tr>
<td>Matzen 1988</td>
<td>N = 8; 4 UPD, 4 BPD</td>
<td>65</td>
<td>Retrospective review; drug-resistant; C/MECT for 6 to 52 weeks (average 23 weeks) for 2 years</td>
<td>Decreased hospitalizations from 30 to 2 in 2 years</td>
<td>Suggested schedule for C/MECT; safer, less expensive/disruptive option for drug-resistant, frequently hospitalized patients</td>
</tr>
<tr>
<td>Clarke 1989</td>
<td>N = 27; 25 UPD, 2 BPD</td>
<td>59</td>
<td>Prospective/control/RUL; no concurrent medication/fixed treatment schedule; drug-resistant or intolerant; weekly x 1 month q 2 weeks x 1 month, then monthly x 5</td>
<td>Of 12 protocol-completers, 1 hospitalized (0.8%); of 15 noncompleters, 7 hospitalized (47%); of 4 psychotic patients, 3 had no relapse</td>
<td>Significant reduction of hospitalization (P &lt; 0.04); compliance and family support stressed as important factors determining outcome</td>
</tr>
<tr>
<td>Jaffe 1990</td>
<td>N = 32; recurrent MDD</td>
<td>68</td>
<td>Naturalistic efficacy and safety study; no concurrent medications; BL and RUL ECT, 1, 2, and 3 weeks and monthly after index ECT; cardiac status monitored</td>
<td>31% (n=10) continued outpatient ECT; 37.5% (n = 12) successfully stopped ECT; 31% (n = 10) failed due to relapse or dropout; no adverse cardiac events despite 50% abnormal electrocardiograms</td>
<td>69% success of unilateral MECT; does not necessarily with breakthrough symptoms but prevents hospitalization and allows better overall functioning than depressed state</td>
</tr>
<tr>
<td>Kramer 1990</td>
<td>N = 5; NA</td>
<td>51.2</td>
<td>Literature review; demonstrates use of MECT with 5 clinical cases</td>
<td>Effective use of MECT in 5 cases</td>
<td>MECT useful for rapidly relapsing or recurring depression and highly lethal depression or schizophrenia</td>
</tr>
<tr>
<td>Thornton 1990</td>
<td>N = 10; 8 recurrent MDD, 1 single-episode MDD, 1 BPD. Of them, 7 had psychosis, 5 dementia, and 3 suicide histories</td>
<td>61.7</td>
<td>Literature and retrospective case review; monthly unilateral ECT over 4 to 113 months</td>
<td>Decreased hospitalizations from 3.1 to 0.3 in 18 months (P &lt; 0.001); 7 were symptom-free, 3 had residual depressive symptoms and poor social functioning, none was psychotic or delusional; dementia did not worsen</td>
<td>MECT useful for older patients, delusional depressions, depressive pseudodementia, poor drug responders, and drug-intolerant patients</td>
</tr>
<tr>
<td>Grunhaus 1990</td>
<td>N = 10, 7 MDD with psychosis, 3 treatment-resistant MDD</td>
<td>19 to 84 (range)</td>
<td>ECT over 18 months; clinically assigned to abbreviated (up to 12 weeks) or full course (6 months); no prospective hypothesis tested with the 2 schedules</td>
<td>6 had “excellent,” complete remission, no residual symptoms for 18 months; 1 “partial” responder, 2 relapsed within days of each ECT, 1 could “not tolerate” ECT</td>
<td>Overall functional and cognitive capacity better with MECT; advanced age is not a deterrent; delusional MDD responds better than nondelusional MDD</td>
</tr>
<tr>
<td>Thienhaus 1990</td>
<td>N = 6; recurrent MDD</td>
<td>“Elderly”</td>
<td>MECT for 6 months to 5 years</td>
<td>Fewer hospitalizations, each of shorter duration</td>
<td>MECT decreases hospitalizations; missed ECTs lead to relapse</td>
</tr>
<tr>
<td>Loo 1991</td>
<td>N = 7, 5 recurrent MDD, 1 BPD, 1 SAD</td>
<td>75</td>
<td>Poor drug responders; ECT q 3 to 5 weeks for 4 months then q 4 to 8 weeks from 1 to 3 years</td>
<td>MECT reduced HDRS and BPRS scores; hospitalization dropped from 58.2 to 3.7 weeks (P &lt; 0.01); recurrence dropped from 4.7 to 1.4 per year (P &lt; 0.03); 2 “resistant” cases had no mood disorder on MECT</td>
<td>MECT reduces hospitalization recurrence and treats “resistant” cases</td>
</tr>
<tr>
<td>Husain 1993</td>
<td>N = 1; BPD</td>
<td>79</td>
<td>MECT for woman with 50-year history; 81 ECTs in 2 years</td>
<td>“Favorable results”</td>
<td>Safety, compliance, and cost-effectiveness of MECT discussed</td>
</tr>
<tr>
<td>Petrides 1994</td>
<td>N = 21; NA</td>
<td>51.6</td>
<td>Retrospective review; CEIT cases from 1985 to 1991; structured telephone interview</td>
<td>66% in remission; 33% had relapsed needing hospitalization; psychosis had no effect on outcome</td>
<td>Concluded “no strong predictors of well-being except CEIT”; pharmacotherapy a weak predictor</td>
</tr>
<tr>
<td>Vanelle 1994</td>
<td>N = 22; 15 recurrent MDD (7 psychotic, 8 nonpsychotic); 7 BP depressed, manic, or mixed (3 psychotic, 4 nonpsychotic)</td>
<td>69.8</td>
<td>MECT given weekly, q 2 weeks, then monthly; adapted to patient; most on medication but classified as drug-resistant</td>
<td>Relapses decreased. Pre-MECT relapses: 3/year with 9.1 weeks between episodes (44% of year in hospital); with MECT: 7% relapsed (P &lt; 0.001) and interepisode time increased to 16 months (P &lt; 0.001); 41% (n = 9) had no recurrence, 77% (n = 17) had 1 recurrence in 10 months, 66% had full or partial remission; recurrence decreased in all diagnostic groups (P = 0.002)</td>
<td>Monthly MECT suggested; relapse as high as 80% after 10 weeks; suicide decreased; older patients (not necessarily with long psychiatric histories) relapse during MECT and need to 2 or 3 ECTs over several days; mood disorders with psychosis give best response (not significant); remission in 100% of BP and 60% of MDD</td>
</tr>
<tr>
<td>Schwarz 1995</td>
<td>N = 21; 17 UP, 4 BP</td>
<td>57</td>
<td>Case-control study of indication and outcome of MECT; patients with multiple hospitalizations, treatment failures, poor drug tolerance, or poor compliance to oral medication</td>
<td>Decreased hospitalizations by 67% from 1.9 to 0.6/year; over 80% did not relapse, and 76% were not hospitalized for over 6 months</td>
<td>MECT effective for drug-resistant, severely ill patients compared with controls who need only acute treatment with ECT or medication alone</td>
</tr>
</tbody>
</table>

BL = bilateral; BPD = bipolar depression; BPRS = Brief Psychiatric Rating Scale; HDRS = Hamilton Depression Rating Scale; MDD = major depressive disorder; NA = not available; q = every; RUL = right unilateral; SAD = schizoaffective disorder; UPD = unipolar depression.
mechanisms of action. Jaffe and others (36) described 2 elderly patients who experienced protracted and unsatisfactory courses of treatment for their “atypical bipolar disorder” with acute and maintenance ECT; the patients subsequently showed dramatic response when treated with lithium in combination with carbamazepine or valproic acid. These 2 subjects were then compared with a typical bipolar patient in whom MECT was effective for symptom resolution. Issues related to difficulty in making the diagnosis of “atypical bipolar disorder” and the unclear significance of ECT-induced manic symptoms with alternate management strategies were also discussed. A retrospective study by Angst and others (37) strongly supports the hypothesis of an ECT-induced switch from depression to hypomania in genetically predisposed individuals. The only predictive factor—a positive family history—is rare in unipolar patients.

**PD**

Kellner and others (38) provide an excellent review of the use of ECT in PD and give recommendations for its appropriate use. Improvements in motor symptoms with ECT in PD are often seen earlier and are unrelated to depressive symptoms or cognition (39,40). Fromm (41) reported 5 patients with prominent rigidity and bradykinesia with noticeable remission after 2 to 3 treatments with ECT over a period of 2 to 3 months; some patients who had been bedridden for many years were able to care for themselves following the therapy. Treatment of depression with nortriptyline is neither necessary nor sufficient for successfully treating the motor symptoms of PD (42,43). Zervas and Fink (44) reported that 2 patients with refractory PD were successfully maintained on C/MECT. Hoflinch and others (45) noted improvement in both disorders of a 49-year-old paranoid and hallucinatory woman with PD and schizophrenia who had been treated with MECT. Friedman and Gordon (46) reported 5 cases of patients aged 52 to 80 years who suffered from PD and depression and were treated with MECT. One died of myocardial infarction several hours after the last planned ECT. The remaining 4 showed marked improvement in mood; 3 also had improved motor function for up to 8 weeks, indicating MECT for continued mood and motor improvement. Finally, a review by Jeanneau (47) concluded that ECT can be an adjuvant therapy in PD, especially in cases of resistance to dopatherapy.

**Schizophrenia**

Üçok and others (48) described a 44-year-old man with a 14-year history of catatonic schizophrenia and a 2-year history of tardive dyskinesia whose course had worsened because of antipsychotic medication resistance and who required 4 hospitalizations in 7 months. Because of early relapses following acute ECT, he received 22 outpatient ECTs during a 9-month period, without antipsychotic medications. He required no hospitalizations during this time and required no hospitalizations during this time and resumed work as a peddler after one year. Hoflinch and others (45) have described their successful MECT treatment of a 49-year-old woman with PD and schizophrenia, and Lohr and others (49) have reported on 2 male schizophrenia patients, ages 26 and 34, also treated successfully with MECT. C/MECT in the treatment of schizophrenia has gone from being overutilized to being underutilized.

**OCD**

Casey and Davis (50) treated an elderly woman with a long history of OCD with ECT after she developed intractable depression: both the OCD and depression resolved. Eventual relapses were treated successfully with MECT. Husain and others (51) reported on a 65-year-old treatment-refractory woman with OCD whom they repeatedly hospitalized for obsessions, restlessness, and depressed mood with intrusive thoughts. A series of bilateral ECT followed by outpatient monthly MECT made her more functional, and she was able to live independently.

**Coexisting Neurological and Affective Disorders**

Dubin and others (52) described 2 males, aged 78 and 61, with recurrent depression and coexisting neurological disorder. One had progressive supranuclear palsy and the other suffered from organic mental disorder secondary to anoxic encephalopathy. Both did well with acute ECT and maintained their recovered state for 2 years on MECT without worsening of the neurologic illness.

**Reversible Dementia**

Bright and others (53) described a case of a 58-year-old woman diagnosed as having Alzheimer’s dementia for 9 years before antidepressant treatment combined with ECT resolved the dementia syndrome. She was then well managed with lithium and MECT every 7 to 8 weeks for 8 years, having undergone 132 ECTs by the summer of 1993. Fink (54) described 2 cases effectively treated for dementia associated with affective disorder, one with MECT and another with lithium. Reversible dementia patients warrant a high index of suspicion and an ECT trial in appropriate cases. Bilateral ECT is often preferable in the elderly, but in the presence of dementia, unilateral ECT can be tried first (55).

**The Use of C/MECT in Special Populations**

**Elderly**

Several studies have referred to the elderly as particularly well suited for ECT (56–58), and several authors specifically discuss MECT in this population (30,55,59–61). ECT and C/MECT are good options for elderly patients, particularly those with depressive psychosis, schizoaffective disorder, or depression with dementia (55) who are treatment-refractory, medication-intolerant, medically ill, or frail. Bilateral ECT is often preferable in the elderly, but in the presence of dementia, unilateral therapy can be tried first. Overall response rates
to ECT of more than 70% can be expected in appropriately selected patients (55).

**Mentally Disabled**

Puri and others (62) reported a 32-year-old chronically relapsing, treatment-resistant, psychotic depressed male with mild mental disability. Treatment with MECT led to a marked, consistent clinical improvement.

**Discussion**

In the past decade, there has been a resurgence of interest in the use of C/MECT. The routine use of C/MECT went through a hiatus that was associated with the impact of pharmacology and psychotherapy. The unmet clinical need of the severely mentally ill, who respond poorly to or do not tolerate medication, has been the main driving force for the reemergence of C/MECT and has provided patients with an important and often lifesaving treatment option. The roles of medication and of C/MECT have not been clearly delineated in maintaining mental well-being following a course of acute ECT. C/MECT has stood the test of time, however, and like lithium, has reemerged as an efficacious, safe, well-tolerated, cost-effective modality for ongoing treatment for selected patients.

**Efficacy**

The evidence to date strongly suggests that patients with highly recurrent, easily relapsing, or medication-resistant mood disorders are most likely to benefit from C/MECT. Most studies on recurrent major depression show a significant impact on reducing hospitalization (21–27,29,33,34). It is safer, less restrictive, and less disruptive than being on ineffective medication and being frequently hospitalized (23). Although C/MECT does not prevent breakthrough symptoms in all patients, it maintains functioning at a higher level than in the depressed state with fluctuating symptoms (25,63). The most common residual symptoms are depressive mood and poor social functioning, but psychotic or delusional symptoms usually remit (27). CECT is the only significant predictor of well-being after receiving treatment with acute ECT; a weak correlation with being on pharmacotherapy has also been found (32). No suicide attempts were seen in Vanelle and others’ (33) group during MECT. In a national survey of completed suicide in Finland, only 2 out of 1397 (0.14%) occurred within 3 months of ECT (64).

Very importantly, most studies favour the use of C/MECT for delusional depressions (27,28,33) because these patients are among the most seriously ill and have a very high rate of relapse (65).

For bipolar disorders, most studies are encouraging (23–25,31,33,34), but some authors are concerned about treating patients with “atypical bipolar disorders,” who may have unsatisfactory responses (35–37) and may switch from depression to mania or vice versa during the course of ECT. Some degree of caution should be exercised if treatment-emergent hypomanic or manic symptoms are observed, and alternate therapies should be considered for those cases.

**Compliance and Acceptability**

The degree of compliance with the treatment plan is a significant factor related to the outcome of C/MECT (21,24,26). Family support is also vital (24). Relapses are common with missed treatments (29), and after 10 weeks without ECT, as many as 80% of patients may relapse, particularly the elderly (33). Acceptability of ECT overall is high with patients and families (66). Unpublished results at our center also show a fairly high level of compliance and acceptability for C/MECT, but in those with low levels of compliance and acceptance, the outcome appears poorer.

**Concurrent Medication**

In general, physicians considering the use of C/MECT for patients on concurrent medications should follow the same guidelines as for inpatient acute ECT (2,7). Neuroleptics may be continued during acute and C/MECT because of their synergistic effects (67,68). Antidepressants are usually stopped or reduced for acute ECT (69), but some practitioners continue them with C/MECT since the evidence for combining them in terms of safety, efficacy, or toxicity is too sparse to be conclusive. Jarvis and others (70) review interactions of novel antidepressants and ECT and suggest that buproprion and amoxapine should be avoided. In certain situations, lithium may be combined with C/MECT, but holding one or 2 doses before ECT may minimize the risk of confusion (71,72). Sedatives and anticonvulsants may inhibit the efficacy ECT, and their use should be minimized (73).

**Risks**

**Physical Risk.** C/MECT appears to place the patient at no extra physical risk than acute courses of ECT (23). In fact, it may be a safer and more desirable option than pharmacotherapy for some patients, particularly elderly or medically compromised individuals who are exquisitely sensitive to the toxic effects of ongoing exposure to medications (28). No adverse cardiac or cardiovascular event was observed during MECT by Jaffe and others (25), despite the fact that 50% of their subjects had abnormal electrocardiograms at baseline. No severe or unusual side effects were seen, and no treatment course was discontinued by Petrides and others (32) during MECT. Dubin and others (59) found MECT to be effective and safe in their group of geriatric patients, some of whom had significant medical problems.
Cognitive Risk. The adverse cognitive effect of ECT is a contentious issue in the clinical practice and research domains of ECT (74). The 4 types of cognitive changes associated with ECT are 1) immediate postictal, 2) retrograde amnesia (memory loss for events prior to ECT), 3) anterograde amnesia (difficulty learning new things after ECT), and 4) longer-lasting subjective memory problems with little or no objective loss, both objective and subjective memory loss require careful evaluation and documentation (75). The problem areas are well outlined by Sackeim (3) and Zervas (76). One of the major difficulties is that of “biased baselines,” which make it difficult to tease apart the various components contributing to an individual’s cognitive impairment. These include the effects of age, the psychiatric disorder, use of concurrent medications, and the effect of previous ECT.

In general, the magnitude of the adverse effects of ECT are highly contingent on the time interval since last treatment (77). The cognitive risk during the acute treatment phase, therefore, would be more of a concern because of the shorter time interval between treatments. In contrast, the time interval between treatments is much longer during C/MECT, thereby reducing the risk of cognitive adverse effects. Most authors agree that certain aspects of memory deficits during C/MECT, like the ability to recall names or retrieve recently acquired concepts, are transient, lasting up to 6 months following discontinuation of ECT (25,28,32). In fact, many domains of cognition show significant improvement with MECT (28,78), and dementia has been reported as no worse with MECT treatment (27). One week to 7 months following ECT, many cases show improvement of overall cognitive, perceptual, attention, and motor function (78). There are some disturbing findings, however, which involve persisting subjective memory deficit 6 months to 2 years after a course of ECT, most notably of selective autobiographical memory (79–81), which may be particularly affected during bilateral ECT. Brain damage has not been reported, even with a patient who received 1250 sessions of ECT in 26 years (82), and absence of cognitive impairment has been documented after more than 100 lifetime ECT treatments over several courses (75). It may be that wider treatment intervals with C/MECT cause fewer cumulative memory deficits (83).

Despite these assurances, no objective data are available on the effects of serial ECT on cognition, and some negative consequences, particularly involving autobiographical data processing, should be suspected until definitive studies are conducted. The bridge between research and clinical practice in the measurement of the cognitive effects of ECT has recently been discussed by Kellner (84) and McCall (85). When considering C/MECT, clinicians must make a risk-to-benefit assessment, which should be shared with patients and their families prior to their signing informed consent for the procedure.
Cost-Effectiveness

With the current economic constraints, governments and third party payers are under constant pressure to reduce expensive inpatient stays to a minimum but also to provide optimal quality of psychiatric care. C/MECT has clearly been shown to reduce inpatient stays in numerous studies. Using data from the Vanelle and others study (33), Steffens and others (86) estimated the direct cost of outpatient maintenance ECT to be less than one-third the cost of the premaintenance ECT period; they also pointed out the indirect savings of an increase in work days and productivity for many patients, less restricted lifestyle, and improved satisfaction for most patients and families.

Malpractice and ECT

There is a low frequency of lawsuits related to the use of ECT. Of a total of 1700 psychiatric malpractice claims filed in the United States from 1984 to 1990, 22 involved ECT and only 4 had complaints related to side effects, complications, or appropriateness of ECT (87). The cost of resolving ECT cases was less than the average of all psychiatric claims. The data do not offer an explanation, but based on clinical interviews with many patients who have initiated malpractice suits, we believe that the pivotal issue comes down to whether the patient and family feel they have been helped by the doctor. Most patients who need and eventually get ECT are in great distress, and ECT usually works promptly, bringing relief from the suffering, usually with a high level of satisfaction. Satisfied patients do not sue their doctors. Table 2 may serve as a useful guide for prescribing C/MECT.

Future Directions

Despite the large number of case reports and abundance of anecdotal evidence, many questions remain to be answered with regard to C/MECT. The major deficits of studies to date are lack of matched control groups and well-defined outcome measurements (88). Many centres that offer C/MECT treat relatively few numbers of patients. There is also some variability in the way the treatments are conducted as well as in how the data base is maintained. A relatively standardized way of administering the treatment with a minimum clinical data base that could be pooled across different centres would be helpful in drawing further conclusions. Sackeim (3) posed a number of questions for future research on C/MECT:

1) What patient population should be studied? There are 2 types of patients who would make good study candidates: those who fail on adequate continuation pharmacotherapy and those who continue to receive C/MECT as their first choice. Giving patients the choice to continue ECT would also present opportunities to study factors that govern treatment acceptability and dropout.

2) With what should C/MECT be compared? Different ways of administering ECT need to be compared, for example, low-potency right unilateral treatment may be compared with high-potency bilateral ECT. Rigorous pharmacotherapy also needs to be compared with C/MECT. The medication(s) used would have to be carefully selected for the study, given the high rate of medication nonresponse among patients who enter ECT protocols. Without a placebo group, the question of what to use as a gold standard must be decided to avoid ambiguity in interpreting the results, particularly if the groups showed little difference. Combinations of drugs and C/MECT also need to be assessed for outcomes.

3) What ECT technique should be used? A rigorous study design would necessitate a fixed schedule of C/MECT, which may compromise individual flexibility and possibly exaggerate cognitive side effects. Since bilateral ECT represents the unquestioned gold standard for efficacy and is more independent of dosage effects than unilateral treatment, however, bilateral ECT would be favoured.

4) How severe are adverse effects of C/MECT compared with other treatments? The accurate measurement of ECT-related cognitive side effects poses an interesting challenge of “biased baselines.” Appropriate instruments, as well as the timing of the cognitive evaluations relative to the time interval since the last treatment, are crucial to accurate assessment (77).

5) How long should C/MECT be given? With documented high rates of relapse within the first 6 months following acute-phase ECT, controlled research on CECT should focus on that time frame and beyond. After that period, patients may continue with MECT or be crossed-over into a maintenance pharmacotherapy regimen.

In summary, C/MECT is a vital tool in the psychiatrist’s armamentarium. It is an effective intervention for reducing relapse, recurrence, and rehospitalization in a selected group of patients, particularly the depressed elderly, who have a good response to ECT in the acute phase and seem to respond poorly to pharmacotherapy. It may also have an important role in the ongoing management of other mood, thought, or motor disorders that are severe enough to warrant intensive care and aggressive treatment, where other therapies have failed. In the 1990s, more practitioners are willing to offer C/MECT as a treatment option than during the previous 3 decades because advances in ECT techniques make the therapy more acceptable to patients (89). Psychiatrists have examined their responsibilities and provided guidelines to encourage its accessibility to a larger number of the severely mentally ill (90). Many aspects of the treatment need further clarification, but C/MECT has reemerged as a viable option as the limits of pharmacotherapy and psychotherapy become apparent in maintaining the mental health of the seriously ill.
Clinical Implications

- C/MECT should be considered as prophylaxis for medication-resistant or intolerant individuals who have responded to an index course of ECT.
- C/MECT reduces relapse, recurrence, and rehospitalization in patients with recurrent mood, thought, or motor-function disorders. Elderly depressed patients respond particularly well to treatment.
- C/MECT is efficacious, well tolerated, relatively safe, and cost-effective when appropriately used for long-term management.

Limitations

- Current evidence is based on case and anecdotal reports with a lack of controlled and well-defined outcome studies.
- The adverse cognitive effect of C/MECT needs further study with subjective and objective evaluations.
- Compliance following index course of ECT is a significant limiting factor influencing outcome.

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Au moment de planifier une approche rationnelle des soins aux patients atteints de troubles psychiatriques majeurs, les cliniciens devraient envisager sérieusement les EC, ainsi que d’autres solutions de rechange.