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# A Systematic Review of the Combined Use of Electroconvulsive Therapy and Psychotherapy for Depression

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## Abstract

**Objective—**Electroconvulsive therapy (ECT) is one of the most effective treatments for severe Major Depressive Disorder (MDD). However, after acute phase treatment and initial remission, relapse rates are significant. Strategies to prolong remission include continuation phase ECT, pharmacotherapy, psychotherapy, or their combinations. This systematic review synthesizes extant data regarding the combined use of psychotherapy with ECT for the treatment of patients with severe MDD and offers the hypothesis that augmenting ECT with depression-specific psychotherapy represents a promising strategy for future investigation.

**Methods—**The authors performed two independent searches in PsychInfo (1806 – 2009) and MEDLINE (1948 – 2009) using combinations of the following search terms: Electroconvulsive Therapy (including ECT, ECT therapy, electroshock therapy, EST, shock therapy) and Psychotherapy (including cognitive behavioral, interpersonal, group, psychodynamic, psychoanalytic, individual, eclectic, and supportive). We included in this review a total of six articles (English language) that mentioned ECT and psychotherapy in the abstract, and provided a case report, series, or clinical trial. We examined the articles for data related to ECT and psychotherapy treatment characteristics, cohort characteristics, and therapeutic outcome.

**Results—**Although research over the past seven decades documenting the combined use of ECT and psychotherapy is limited, the available evidence suggests that testing this combination has promise and may confer additional, positive functional outcomes.

**Conclusions—**Significant methodological variability in ECT and psychotherapy procedures, heterogeneous patient cohorts, and inconsistent outcome measures prevent strong conclusions; however, existing research supports the need for future investigations of combined ECT and psychotherapy in well-designed, controlled clinical studies. Depression-specific psychotherapy approaches may need special adaptations in view of the cognitive effects following ECT.

### Keywords

Electroconvulsive therapy; Psychotherapy; Cognitive Behavior Therapy; Interpersonal Psychotherapy; Major Depressive Disorder

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## Introduction

Electroconvulsive therapy (ECT) is one of the most effective treatments for severe Major Depressive Disorder (MDD), carrying benefits of relatively high response and initial remission rates [1] in an efficient time frame (e.g., approximately three – four weeks) compared to other antidepressant treatments (e.g., six or more weeks) [1-5]. Despite the high efficacy of ECT, prolonged remission is uncertain, and threatened particularly by lack of continued care [6, 7]. To protect against relapse following an acute phase ECT, two primary strategies have been recommended: augmenting ECT with pharmacotherapy during the acute phase [8, 9], or continuing the treatment course beyond early response with only one of these treatments [10]. A new untested strategy entails combining antidepressant medication with ECT throughout the acute and continuation phases of treatment, with continuation ECT administration based upon individual symptom severity [11]. Yet, relative to the augmentation strategies common to pharmacotherapy, augmenting ECT with depression-specific psychotherapy has received limited attention [12].

There are two scientific rationales that support augmenting ECT with evidence-based psychotherapy. First, two contemporary psychotherapies, Cognitive Behavioral Therapy (CBT) [13] and Interpersonal Psychotherapy (IPT) [14, 15] (often referred to as depression-specific psychotherapy) have been found efficacious in both the acute and continuation phases of treatment for MDD and have been shown to prolong remission, and perhaps recovery [16-27]. In addition, there is a substantial body of research highlighting improved clinical and functional outcomes when evidenced-based psychotherapy is combined with pharmacotherapy in the long-term treatment and management of patients with chronic, treatment-resistant depression [28-30].

Second, neuroimaging suggests that ECT and depression-specific psychotherapy have distinct mechanisms of action that may result in specific treatment effects. Electroconvulsive therapy may decrease cerebral metabolic rate for glucose (rCMR) bilaterally in the superior frontal lobe (dorsolateral prefrontal cortex, medial prefrontal cortex), the parietal regions, posterior cingulate gyrus, and the medial temporal lobes [31]. On the other hand, studies suggest that there are early prefrontal changes with psychotherapy and differential responses throughout the course of therapy [32-35]. For example, both the hippocampus and mid-cingulate exhibit increased activity after psychotherapy while activity decreases in the orbital frontal and medial frontal cortices [32]. Such changes in the mood regulating areas of the brain potentiate thinking and behavior changes associated with psychotherapeutic techniques. It has been hypothesized that ECT may work from the "*bottom-up*," whereas psychotherapy may work from the "*top-down*" [32, 34].

Considering the differential activation of these distinct brain regions, it seems reasonable to investigate the efficacy of augmenting ECT with depression-specific psychotherapy to improve the symptoms and functioning of patients suffering from severe MDD [36]. Although the literature reflects a significant amount of research concerning the augmentation of antidepressant medication with psychotherapy, it has been assumed by some that post-treatment cognitive impairment impeded the effectiveness of individual psychotherapy [37]. Documented side effects of ECT include memory deficits, specifically anterograde amnesia (up to one month) for newly learned information and retrograde amnesia (up to six months or longer) for autobiographical information [38]. These memory

[1]The authors are using the conceptualization of response, remission, and recovery as defined by the American College of Neuropsychopharmacology Task Force (2006). Original articles included in this review use synonymous terms though with different meaning as they were published before publication of the ACNP Task Force. We present the terms as used in the original studies and when appropriate note the definition by either the ACNP Task force or the original study authors.

deficits seem to preclude psychotherapy, particularly if administered without awareness of the special needs of this population. However, given the advances in ECT and evidence-based psychotherapy, we hypothesize that with proper adaptation, depression-specific psychotherapy can be *personalized* as an augmentation intervention to meet the needs of severely depressed patients treated with ECT. The purposes of this paper are to provide a framework and rationale for this hypothesis, conduct a systematic review of available studies investigating previous combinations in the acute and continuation phase of treatment for MDD, and suggest starting points for developing this augmented or sequenced intervention for adults with severe depression.

## Systematic Review Method

To accomplish the systematic literature review [39], we (authors SMM and ARB) performed independent searches in the PsychInfo (1806 – 2009) and Medline (1948 – 2009) databases with the following terms: Electroconvulsive Therapy (including ECT, ECT therapy, electroshock therapy, EST, shock therapy) and Psychotherapy (including cognitive behavioral, interpersonal, group, psychodynamic, psychoanalytic, individual, eclectic, supportive). To control for duplicate information and redundancy, the results of the two independent searches were imported into and managed with Endnote (version X2 for Mac, The Thomson Corp.). We included only those articles in this systematic review that mentioned ECT and psychotherapy (or one of the variants mentioned above) in the abstract, and provided a case report, series, or clinical trial. A total of six studies (English language literature) were included in this review. These studies were between the dates of 1946 – 2006, from the United States and United Kingdom; the methodologies varied from theoretical conceptualizations and case reports to randomized, controlled trials.

## Combined Use of ECT and Psychotherapy

The earliest publication describing the incorporation of psychotherapy with EST[2] reported upon 100 cases of “psychoneuroses” treated over a five-year period at St. James Hospital in Portsmouth, UK in 1946 [40]. The authors suggested that psychiatric symptoms were caused by faulty electrical patterns in the brain which, when altered by EST, resulted in an amnestic state that allowed for new simplified patterns to develop. “Simple psychotherapy” was given in the form of explanations and reassurance as the patient's memory returned, and occupational therapy was used to encourage the patient to take part in social activities. The course of treatment involved as many as four EST treatments a day, but no information is given in regard to the frequency or even the use of formal psychotherapy sessions with patients. Patients were considered “recovered” when symptom-free and stable enough for discharge, and considered “relieved” when much improved but when stability was in doubt. Within this nomenclature, 51% were classified as “recovered,” 46% as “relieved,” and 3% “not improved.”

More than ten years later, a group of American psychiatrists practicing at the Stony Lodge inpatient facility in New York published a preliminary report on 100 cases treated with “regressive electroshock treatment” or “REST” [41]. Although the majority of the cases were classified with some form of schizophrenia, two of the cases were diagnosed with “Manic Depression.” Considered a “drastic” treatment at the time (and today an unacceptable regimen by current psychiatric treatment standards), REST entailed multiple daily EST treatments continuing until the patient reached a state of infantile behavior characterized by amnesia, muteness, ataxia, and complete incontinence. At the termination of REST, the patient was then cared for as an infant, being slowly rehabilitated throughout

[2]Early studies reflect the terminology “electroshock therapy” and the abbreviation “EST.”

the same developmental trajectory as a child (*e.g.*, being carried, fed by bottle, spoon-fed, taught to sit up and walk, toilet trained) by Nursing Assistants with specialized training. Psychotherapy in the protocol consisted of two or three short visits daily over 10-14 days during which the patient began emerging from the regressed state. Psychotherapeutic techniques included answering questions, acting as the patient's lost memory, and serving as a reassuring, stable person upon whom a “helpless person” may depend. Patient outcome was classified along a continuum anchored by “unimproved” (no change) and “recovered” (disappearance of symptoms, ability to function, and with adequate insight). Of the two patients being treated for Manic Depression, only one was classified as “recovered” with the other identified as “improved.”

Regressive electroshock treatment is also reported upon in the case study of a patient treated at the Menninger Clinic [42]. Treatment was described as a total of 30 electroshock treatments over a period of ten consecutive days and, as memories returned, the patient was “re-educated” with psychotherapy three to four times a day by the treating psychiatrist. As the frequency of psychotherapy sessions was reduced, occupational therapy was introduced and, upon discharge from the hospital, outpatient treatment was transferred to a supportive psychotherapist.

Jaffe et al. [43] demonstrated the benefit of subconvulsive and convulsive electro-stimulation (EST) as an adjunctive treatment to individual psychotherapy in a case report of an adult female patient with multiple psychiatric diagnoses (e.g., depression, anxiety, anorexia). Upon not showing benefit from a non-specified psychotherapy alone, two courses of EST were adjunctively provided. The first course consisted of 12 subconvulsive treatments provided three times weekly, and the second course consisted of 14 convulsive treatments provided three times weekly. The patient was monitored by electroencephalography (EEG) during both EST courses. No change in EEG was observed with subconvulsive EST, but decreased slow wave activity was documented with convulsive EST. The authors suggested that the patient's clinical improvement was related to the physiologic changes in the EEG, and that EST can benefit psychotherapy.

Group psychotherapy, another approach to the combination of psychotherapy and EST, is described in the multidisciplinary treatment of depression in a hospital inpatient unit [44]. Goals of the group were focused upon the “reorganization and remolding of a patient's new growth” post-EST rather than upon augmenting treatment for the disorders themselves. Patients were encouraged to process their feelings about the shock treatment and its concomitant adverse effects (*e.g.*, forgetfulness). The investigators reported favorable outcomes, including improvements in feelings of self-worth and self-awareness, reality-testing, and acquisition of positive coping mechanisms.

The most recent investigation of psychotherapy and ECT tested the potential benefits of CBT [37]. Although methodological concerns dictate cautious interpretation (*e.g.*, N = 9, response established by clinician subjective report rather than by standardized instrument or masked independent evalutor, and lack of a control group), the authors concluded that CBT was of benefit to study participants. Specifically, patients who received 12 weeks of CBT after an index course of ECT for MDD either maintained their response to ECT or continued to show decreased depressive symptoms at six- and nine-month follow-ups as measured by the Beck Depression Inventory and the Clinical Global Impression scale. Methodological concerns aside, these preliminary data in a small sample suggest a hypothesis worthy of attention: augmenting ECT with effective depression-specific psychotherapy (e.g., CBT or IPT) will prove feasible, safe, and will promote remission for patients with severe depression.

## Summary of Findings and Future Directions

Prior research investigating the combined use of ECT and psychotherapy has reported beneficial effects in the treatment of psychiatric illness, but all studies varied in methodology, lacked appropriate controls, and provided limited data, making replication or strong conclusions difficult. Most authors did not provide information on psychotherapy, ECT procedures, or outcome measures (i.e., type of stimulus wave form, electrode placement configuration, number of ECT treatments, type of psychotherapy, number of sessions, therapist qualifications, integrity of the psychotherapy, symptom or severity rating scales). Most important, the majority of the historical studies reviewed did not adhere to robust, controlled clinical science methods such as the inclusion of a comparative control group or control condition.

The established efficacy of depression-specific psychotherapy as monotherapy or augmentation in the treatment of chronic and/or severe MDD suggests that similar rigorous investigations of psychotherapy with ECT may fill an essential gap in clinical knowledge. Important covariates within the heterogeneous subtype of patients with MDD include patients with and without with melancholic features [45-47], MDD with atypical features [48, 49], MDD with psychotic features [50-53], recurrent MDD [54-56], and MDD with severe suicidal ideation [57-60].

A major challenge to combining these two therapeutic modalities is the cognitive sequelae of ECT which, if not taken into consideration, could potentially minimize the benefits of depression-specific psychotherapy. During the treatment course, disorientation (e.g., forgetting time of day, location) occurs and may last between 20 to 90 minutes post the ECT session. Anterograde amnesia has an onset during the first treatment and can persist for up to one month after the ECT course. Lastly, retrograde amnesia also has an onset during the first treatment and can persist for as long as six months after the ECT course [38, 61]. Although advances in ECT (see Table 2) have minimized the cognitive side effects, these are still problematic for patients (for a full review of the cognitive effects of ECT see Fraser et al. [62]).

To mitigate the above challenge of temporarily impaired cognitive function, future investigations evaluating the efficacy and effectiveness of combination ECT and evidenced-based psychotherapy should ensure that both treatments are administered at optimum levels. Regarding ECT, parameters should be chosen that would result in the least adverse cognitive side effects. Specifically, ECT should be administered with ultra brief pulse waveform, dose titrated with the empirical titration method, electrode configuration should be right unilateral or bifrontal, and treatment should be systematically delivered until the patient achieves remission [63]. These parameters are essential to preserve cognitive functions [64-66]. For example, psychotherapeutic treatment could be provided on days when ECT is not administered to allow the patient to regain, to the fullest extent possible, adequate cognitive function. At the same time, key questions to ask are: What is the critical time point at which to introduce evidence-based psychotherapy, and what are the key psychotherapeutic components to include in such a strategy? Such studies have been done in pharmacotherapy research [67-69], but a paucity of information remains within psychotherapy for the depression and ECT literature. Moreover, with established evidence of the beneficial combination of evidence-based psychotherapy and medication [25], and ECT and medication [9], another question emerges: Should pharmacotherapy be introduced with the combination of evidenced-based psychotherapy and ECT?

Beginning depression-specific psychotherapy before ECT and continuing it afterward deserves study [70]. Key components of the psychotherapeutic intervention might consist

first of an introduction to the basics of the given depression-specific psychotherapy, as well as MDD and ECT. Additional emphasis before ECT could be placed upon teaching strategies for cognitive remediation the patient could use when learning new concepts (in spite of any impaired memory functions). These key components need to be interwoven and repeated to produce a depression-specific psychotherapy tailored to patients with severe depression who also have cognitive adverse effects secondary to ECT.

Just as CBT and IPT have been adapted according to unique needs of specific populations, these standard structured approaches require modifications tailored to ECT patients. For example, in such “tailoring”, a heavy focus upon behavioral activation could be helpful [71]. Cognitive behavioral interventions like problem solving and cognitive restructuring can be applied to increase memory and cognitive flexibility (*e.g.*, rehearsal to ensure that material discussed in sessions is maintained). Hypothesis testing and cognitive restructuring for thoughts such as, “How can I learn, when I can't remember?” would be crucial. The IPT model can be applied to feelings of grief or loss the patient may have regarding the severe depression, and the sequelae of both the illness and the treatment. Either approach encourages bringing in family members to increase the social support available to the patient, and helps significant others learn specific strategies to fulfill concrete needs of the patient during the recovery period.

Indeed, Hollon et al. [25] suggest that CBT and IPT are beneficial in patients with severe depression, may improve treatment response when combined with other antidepressant treatments (e.g., pharmacotherapy), and can have lasting therapeutic effects. Thus, there is evidence to suggest that CBT and IPT can be useful augmentation strategies for patients with severe depression. A next step would be to adapt those strategies for patients undergoing ECT.

Standard neurocognitive instruments such as the Mini Mental State Examination (MMSE) [72] or the Montreal Cognitive Assessment (MoCA) [73] may be useful to document the global cognitive function status of the patient to better assess suitability for psychotherapy or determine necessary adaptations during the therapy process. Though no specific neurocognitive instrument for use with patients undergoing ECT exists at this time, global cognitive instruments can help establish that the patient is oriented and is able to attend to verbal and visual information.

Additionally, prospective research may benefit from the American College of Neuropsychopharmacology (ACNP) Task Force [72] and others' recommended definitions for response, remission, recovery, relapse, and recurrence [74, 75]. Without consensus on these terms, confident interpretation of clinical outcomes is compromised. The ultimate goal of patient-oriented research is to effect change in community practice, provide clinicians and patients the knowledge necessary to inform treatment for MDD and make cost effective decisions, and most important to promote complete recovery [76].

In conclusion, based on the advances in ECT and evidence-based psychotherapies, their combined use warrants reappraisal and further investigation in the treatment and management of patients with MDD. As newer, more effective antidepressant strategies are needed and developed to prevent relapse and recurrence [77, 78], there is a vital interest in the development and evolution of multimodal therapies that are both individualized and targeted to the specific psychiatric disorders and targeted to unique patient groups [79]. Given the limited uncontrolled, yet encouraging prior findings [80], future research is warranted to better integrate the beneficial attributes of ECT and evidenced-based psychotherapy. Thus, we hypothesize that the proposed combined or augmented uses may

benefit patients, and that this intervention strategy is worthy of rigorous testing employing cutting edge research methodologies.

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**Table 1**

**Studies that Examined the Combination of Electroconvulsive Therapy and Psychotherapy**

| Year | Author | Method/Sample | ECT | Psychotherapy | Conclusion |
|---|---|---|---|---|---|
| 1946 | Milligan | Case series of 100 inpatients.<br>Patients presented with anxiety states, hysteria, obsessional states, or mixed states | Average dose = 180 volts for 4 seconds<br>No restraint or anesthetic used<br>Maximum of 4 ECT treatments per day.<br>ECT treatments were spaced to allow patients to emerge from the confusional state | Simple psychotherapy (explanation and reassurance)<br>Occupational therapy (social activities on inpatient ward)<br>Psychotherapy was administered between ECT sessions | 51% of patients recovered (defined as symptom free on discharge) and none relapsed at follow up<br>46% of patients were relieved (defined as much improved) and 6 of these patients showed signs of relapse. It was reported that 3 of the patients who relapsed received insufficient treatment<br>3% of the patients did not improve (defined as initially responding to treatment, but did not complete treatment course)<br>Concluded that ECT is effecting in treating select cases of psychoneuroses<br>ECT should be administered with psychotherapy to assist in resynthesis of the patient's personality |
| 1957 | Glueck et al. | Case series of 100 patients (over a six-year period)<br>74% of the cases were diagnosed with schizophrenic reactions (51 patients diagnosed as paranoid, 13 as catatonic, 10 as hebephrenic)<br>Psychological measures were administered to the first 50 cases. These measures included: Rorschach Inkblot Test, figure drawing test, BVMG, CAS, COWAT | REST administered 3times a day, five days a week<br>Minimum of 60 treatments, maximum of 72 treatments | Supportive therapy was initiated during the 14-day period after the last REST treatment<br>Supportive psychotherapy consisted of 2-3 sessions per day, for 10-14 days, Minimum of 20 sessions, maximum of 42 sessions | Immediate results (3-months after completion of treatments): 48 of the cases recovered or showed marked improvement, and 24 showed improvement. 11 cases showed slight improvement, and 17 showed no change.<br>Late results: 38 of the cases recovered or showed marked improvement, and 9 showed improvement. 5 cases showed slight improvement, 17 showed no change, and outcome for 31 of the cases was unknown |
| 1959 | Bonn & Boorstein | Case study<br>Female patient age 33, hospitalized, depressed, obsessive and phobic symptoms | REST; three treatments administered daily<br>Total of 30 acute REST treatments | Supporting psychotherapy, Expressive psychotherapy, Anaclitic psychotherapy<br>Psychotherapy was initiated on first day after last ECT. And consisted of 2-hours or 5-hours per week | After 6-months of hospitalization, depressive and phobic symptoms were ameliorated and patient was discharged |
| 1961 | Jaffe et al. | Case report of one patient, 44-year-old, widowed, woman, and mother of a 12-year-old son<br>Presenting symptoms upon admission to inpatient psychiatric unit included: depression, anxiety, anorexia, varied physical complaints, feelings of unreality and isolation | Patient was prescribed EST as an adjunctive treatment to psychotherapy<br>EST treatment period 1: patient received 12 EST (over span of 27-days) treatments at subconvulsive levels. No changes in EEG slow wave activity were reported.<br>EST treatment period two: patient received 14 EST treatments (administered 3 times weekly) at convulsive levels. Changes in EEG slow wave activity were reported for 4 days. | Patient was seen in psychotherapeutic sessions thrice weekly<br>The psychotherapist was unaware if the EST was subconvulsive or convulsive | The patient showed clinical improvement as evidenced in her verbalization of emotions, emergence of her critical thought processes, and increased stability of the psychotherapeutic relationship<br>The authors conclude that EST and psychotherapy are distinct therapies that can be combined for treatment |

| Year | Author | Method/Sample | ECT | Psychotherapy | Conclusion |
|---|---|---|---|---|---|
| 1971 | Cohen | Descriptive study | EST was administered with bilateral electrode placement<br>The total number of treatments administered is unknown | Group psychotherapy (range of 7-10 patients per group) was administered during acute, continuation, and maintenance treatment phases<br>Sessions were conducted thrice weekly by a nurse clinical specialist or clinical psychologist | Group therapy helps to facilitate reorientation, communication, and coping strategies |
| 2006 | Fenton et al. | Open label, controlled trial<br>9 patients diagnosed with major depressive disorder were enrolled<br>6 patients completed the study<br>Mean age=54.3 ± 5.7 (range: 48-65)<br>50% had psychotic symptoms | ECT was administered with bilateral electrode placement (brief pulse) for 5 patients, and with right unilateral electrode placement (brief pulse) for 1 patient<br>ECT was dose titrated using the empirical titration method<br>Total acute ECT treatments= average 9.6 ± 3.2<br>Total continuation ECT treatments= average 7.6 ± 1.96 | CBT (based on Aaron Beck's model)<br>CBT was modified to include additional emphasis on note taking and review of materials<br>Homework included activity charts and thought records<br>Adjunctive CBT was initiated during continuation ECT phase. Patients were treated in weekly individual sessions over a period of 12-weeks for a total of 12 sessions<br>CBT was administered by trained and certified clinicians | Significant decrease on the Beck Depression Inventory (BDI) and significant improvement on the Clinical Global Impression Scale (CGI)<br>CBT and ECT can be administered together to help prolong remission in depression |

BVMG=Bender Visual Motor Gestalt, CAS=modified Wechsler Bellevue test (subtests: Comprehension, Arithmetic, Similarities), COWAT=Controlled Oral Word Association Test, CBT=Cognitive Behavior Therapy, ECT=Electroconvulsive Therapy, EST=Electroshock Therapy, REST=Regressive Electroshock Therapy

**Table 2**

**Advances in the Administration of Electroconvulsive Therapy to Reduce Cognitive Adverse Effects***

| ECT Parameter | Modification to Improve ECT |
|---|---|
| Stimulus wave form | ECT device waveform transitioned from sine wave, to brief pulse, and recently to ultra brief pulse. Only ECT devices that deliver brief pulse or ultra brief pulse are manufactured in the United States. Ultra brief pulse confers the least cognitive effects. |
| Stimulus dosing | The first ECT is dose-titrated on the first ECT session using the age, half-age, or the empirical titration method. |
| Electrode placement configuration | Electrode placement configurations routinely used are bitemporal, bifrontal, or right unilateral. Right unilateral has been found to have less cognitive side effects relative to bitemporal. |
| Continuation ECT dosing algorithm | Dosing strategies for the continuation phase of ECT have been fixed. Novel dosing algorithms are being explored (e.g., Symptom Titrated Algorithm Based Longitudinal ECT (STABLE)) that are individually tailored to the patient's clinical presentation. |

ECT=Electroconvulsive therapy

* The information included in this table was based on the following references:

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