

controversy  
no merits ~~MAETA~~

---

# **Psychiatry**

Essentials of Clinical Practice

With Examination Questions, Answers, and Comments

Second Edition

**Ian Gregory, M.D., F.R.C.P. (C), F.R.C. Psych.**

Professor and Chairman, Department of Psychiatry,  
Ohio State University College of Medicine,  
Columbus

**Donald J. Smeltzer, M.A.**

Associate Professor, Department of Psychiatry,  
Ohio State University College of Medicine,  
Columbus

ECT - controversy

1983

*Little, Brown and Company*  
Boston/Toronto

the absence of CNS depressant effects and the impossibility of physical dependence.

### ELECTROCONVULSIVE THERAPY (ECT)

Although descriptions of similar treatments had appeared in medical journals over a century earlier, the use of convulsive therapy in psychiatry began with work reported by Laszlo von Meduna in 1933. Based on a theory later shown to be incorrect, his hypothesis held that schizophrenia and epilepsy were mutually antagonistic diseases, and he developed a treatment method involving provocation of grand mal seizures by injections of various drugs.

Although convulsive therapy was moderately helpful for some schizophrenic patients, it was found to be far more effective for mood disorders, especially severe depression. In 1938 Cerletti and Bini demonstrated that electric current had many advantages as a convulsive agent, and ECT gradually became the preferred form of the treatment.

In 1975 the American Psychiatric Association established a task force to "Review the current use of ECT, both typical and atypical, the prevailing criticisms of its use, and the recent and current research on the subject . . ." The lengthy report of the task force was published in 1978 and is a useful reference for further information on the topics discussed here. It contains a very thorough review of all relevant literature published up to that time, and detailed discussions of available scientific evidence on the efficacy, safety, and possible adverse reactions to ECT.

#### Indications for ECT

ECT is equal or superior to all other known treatments for *severe depressions*, especially those accompanied by psychotic features (delusions, hallucinations, or stupor), marked psychomotor disturbance (agitation or retardation), or extreme vegetative changes. However, it is often not the first treatment tried, because many of these depressions also respond well to tricyclic or other non-MAOI antidepressant drugs. ECT is most likely to receive priority consideration when (1) the risk of suicide is high; (2) the patient is dehydrated and refuses food and fluids; (3) drug therapy has been found ineffective; or (4) the dangers of drug therapy are too great to permit its effective use.

ECT is occasionally used in manic disorders, schizophrenias or schizophreniform syndromes (primarily those with catatonic features), and schizoaffective psychoses. In these disorders it has little or no advantage over other treatments for the average patient. Its use is usually limited to emergency situations, and to selected cases in which severe symptoms remain despite adequate dosage of medication. It is sometimes effective for depressions of moderate intensity, but may (1) make matters worse by increasing anxiety, or (2) be followed by rapid relapse if there is a persistent exogenous stress.

Some psychiatrists use or recommend ECT for conditions other than affective disorders or schizophrenias, but these uses are controversial and not well supported by scientific evidence.

#### Contraindications

For some persons having serious nonpsychiatric illnesses, ECT may be far less hazardous than untreated psychosis and relatively safer than psychotherapeutic medications. The risks associated with drugs tend to be relatively constant at all times of day and night, while the risks from ECT are greatest during the period immediately surrounding each treatment. This makes it feasible to have emergency equipment, medications, and personnel readily available during the time of risk.

The most serious contraindication to ECT is *brain tumor with increased intracranial pressure*. Since a marked increase in intracerebral pressure occurs during the electrically induced seizure, there is a risk of herniation or other structural damage to the brain; several fatalities have occurred in this manner.

Other conditions in which the use of ECT involves special hazards include: recent therapy with reserpine (which may lead to cardiac arrest during the treatment); recent myocardial infarction or other serious cardiovascular disease; and advanced pregnancy. These are *not* absolute contraindications to the treatment; the APA task force characterized them as "conditions requiring extraordinary care and experience."

Several conditions that were once considered contraindications involved hazards caused by the mechanical effects of the convulsion. The latter may be completely eliminated by use of a muscle-relaxing drug prior to the treatment.

Long-acting  
metabolites

No  
Yes  
Yes  
Yes  
Yes  
No  
No

Yes  
No  
No

ions; they are  
individualized  
receive lower  
ckage inserts.  
ypnotics.

is reported  
ration, and  
ason.

ore benzo-  
only drug  
ibed is *me-*  
significant  
the possi-  
2) possible  
ent of tol-  
epines for  
a relatively  
erious and  
including  
requent al-

scribed as  
*phenhydra-*  
aril). Their  
presence  
ing effects,  
antages are

Finally, any condition that contraindicates general anesthesia (e.g., severe respiratory disease) may preclude the use of ECT. However, some psychiatrists may still consider "unmodified" ECT (i.e., without anesthesia and other pretreatment medications) in such cases.

#### Preparation for ECT

*Pretreatment Medical Workup.* This workup is primarily concerned with respiratory, cardiovascular, musculoskeletal, and neurologic status, since these are the organ systems most likely to be involved in any emergency during treatment. The patient or other informants should be questioned about previous adverse reactions to drugs and any experiences with anesthesia. Commonly an ECG, EEG, spine x-ray film, and chest films are obtained if these have not recently been done; however, films are *not* done if the patient is pregnant. Other investigations and consultations are ordered if indicated by these findings or any special problems of the patient (e.g., recent surgery or dental problems). Some psychiatrists routinely order laboratory testing of plasma pseudocholinesterase activity (to determine the patient's ability to metabolize succinylcholine), but most request this only in selected cases.

*Use of Medications.* When possible, all medications should be stopped during a course of ECT. When this seems inadvisable, the need for each drug should be individually evaluated, and dosage adjusted to the minimum possible. Drugs with prominent cardiovascular effects (e.g., antihypertensives, antidepressants, and antipsychotics) are generally of greatest concern. All drugs should be scheduled so that a maximum drug-free interval precedes each treatment. Since nothing may be taken by mouth for about 8 hours prior to each treatment, drugs absolutely required during that period should be injected.

*Informed Consent.* Written informed consent for ECT is currently required by law in all states. Most laws, but not all, include provisions for obtaining consent from a close relative, guardian, or court on behalf of an incompetent patient. Some states permit limited use of ECT without consent in certain emergency situations. Since there are numerous variations, it is necessary for physicians and hospital employees to be familiar with the legal requirements that pertain to their specific situations.

The APA task force report contains a lengthy analysis of such legal and ethical issues as the right to treatment, the right to refuse treatment, the use of ECT in unusual situations, and the nature of informed consent. Regarding the latter, it specifically recommends that the person giving consent for ECT receive understandable explanations of the following: (1) the nature and seriousness of the illness; (2) the probable course with and without ECT (without giving guarantees); (3) a description of the treatment; (4) the nature, degree, duration, and likelihood of specific risks, side effects, and complications, especially posttreatment amnesia and confusion; (5) a description of reasonable alternative treatments, and why ECT is recommended; (6) the right to accept or refuse ECT, and to revoke consent at any time; (7) the time limit for which consent is given; and (8) the cost of the treatment.

#### Treatment Procedures

*Preparation of the Patient.* To preclude the danger of regurgitation and aspiration of gastric contents, *nothing* should be taken by mouth for about 8 hours prior to each treatment. This must be carefully explained to the patient, and nursing personnel should assist in ensuring compliance. Immediately before the treatment the bladder should be voided and dentures should be removed (unless considered necessary to protect remaining teeth from fracture). Mouth gags of various types are used to protect teeth and tongue during the treatment.

*Unmodified ECT.* ECT was once given to conscious patients without premedication. This procedure, called *unmodified ECT*, produced instantaneous loss of consciousness and was not painful in any way. However, patients often became fearful while awaiting electrode placement and the convulsive stimulus, and the muscular activity accompanying the seizure occasionally led to dislocations, fractures, and similar complications.

*Pretreatment Medications.* Today ECT is usually *modified* by several medications administered shortly before treatment. An injection of an *anticholinergic* such as atropine (0.4–2.0 mg) or methscopolamine (0.5–1.0 mg) is frequently given 30 to 60 minutes before the treatment. Its purpose is to reduce secretions, to lessen the possibility of vomiting, and to block vagal stimulation (supposedly

the most likely is produced by another ultra-muscle relaxant administered through the patient's lungs connected through the barbituric line is used and cardiac function.

Any of these the risk for cerebral omitted or repeated should never be caused by the fasciculatory control cannot be used subconvulsive

*Electrode Placement* is either bilateral or unilateral hemispheric lateral ECT procedure, while of therapeutic efficacy have equivalent results believe that requires fewer treatments

*Convulsive Stimulus* as soon as adequate. The seizure threshold of sedative medication stimulus order for 0.5 to 1.0 amount of current consisting of a tonic phase or as EEG monitoring of sufficient duration that seizures last a few minutes.

*Posttreatment* vital signs should

the most likely cause of cardiac arrest). *General anesthesia* is produced by intravenous infusion of methohexital or another ultra-short-acting barbiturate. A *depolarizing muscle relaxant* such as succinylcholine (Anectine) is administered through the same intravenous line as soon as the patient loses consciousness. (Separate syringes are connected through a three-way stopcock to prevent mixing of the barbiturate and muscle relaxant.) The intravenous line is usually left in place until normal breathing and cardiac function have returned following the treatment.

Any of these drugs may be contraindicated or increase the risk for certain patients, and in selected cases may be omitted or replaced by other drugs. The muscle relaxant should never be administered to a conscious patient because the fasciculations are painful and the loss of respiratory control is terrifying. However, if an anesthetic cannot be used unconsciousness may be produced by a subconvulsive stimulus from the ECT machine.

**Electrode Placement.** The pair of electrodes may be positioned either *bilaterally* or *unilaterally* (over the nondominant hemisphere). There is impressive evidence that *unilateral ECT produces less posttreatment amnesia than bilateral ECT*, while opinion is divided on the comparative therapeutic efficacy. Some studies suggest that both forms have equivalent antidepressant effect, but many psychiatrists believe that bilateral ECT is faster acting (i.e., requires fewer treatments) or therapeutically superior.

**Convulsive Stimulus.** The electric stimulus may be applied as soon as adequate muscle relaxation has been obtained. The seizure threshold varies as a function of age, amount of sedative medication, and other factors. An adequate stimulus ordinarily consists of 110 to 170 volts applied for 0.5 to 1.0 seconds. It is desirable to use the smallest amount of current that produces a *grand mal seizure*, consisting of a tonic phase lasting about 10 seconds and a clonic phase of about 30 seconds. Various methods such as EEG monitoring may be used to ensure that a seizure of sufficient duration actually occurs; there is evidence that seizures lasting less than 25 seconds may not be therapeutic.

**Posttreatment Care.** Following the seizure, the patient's vital signs should be monitored and respiration sup-

ported until the condition has stabilized and a normal tidal volume has returned; he or she may then be moved to an observation area for the remainder of the postconvulsive coma. The teeth should be inspected and there should be close observation for possible regurgitation and aspiration. To minimize risk of the latter, suction should be available close by, and the patient should be kept in a prone position until pharyngeal reflexes have returned and response to verbal stimuli occurs.

**Timing and Number of Treatments.** ECT is usually given 3 to 5 times weekly, with the interval determined on the basis of therapeutic response, amount of confusion following treatments, and electrode placement. Bilateral treatments cause greater amnesia and are usually given less frequently than unilateral treatments. Elderly patients who show pronounced confusion after treatments are sometimes given only one treatment weekly. At the other extreme, ECT is rarely given more than once daily except as an emergency measure.

A full course of ECT for depression typically consists of 6 to 10 treatments over a period of 2 or 3 weeks, and rarely exceeds 15 treatments. For other disorders a larger number of treatments *may* be required.

#### Side Effects, Complications, and Normal Changes

Even though patients with "calculated risks" are sometimes treated with ECT, *death* is an extremely rare complication when the treatment is performed according to modern standards. Somewhat higher rates were reported in the past, but two changes in practice seem important: curare is no longer used as a muscle relaxant, and precautions against unexpected emergencies are now routinely employed (e.g., support of respiration and availability of a cardioverter).

A 1947 study reported no deaths in a series of 20,645 treatments; a 1956 survey reported five deaths in approximately 70,000 treatments; and a 1968 report noted one death in about 10,000 treatments. These and similar statistics are difficult to interpret without knowing more about such factors as patient selection (i.e., which types of risks were excluded from the treatment) and specific treatment methods employed. However, the data compare favorably with mortality associated with any minor surgical procedure performed under general anesthesia.

The cause of ECT-related death is usually cardiac complications occurring shortly after the treatment.

*Common side effects following each treatment* are headaches of several hours' duration; transient centrally mediated changes in blood pressure and cardiac rhythm; increased appetite (often a therapeutic benefit); brief euphoria; and postconvulsive confusion and amnesia.

*Rare side effects and complications* that may occur during or immediately following a single treatment include: cardiac arrest; prolonged apnea; dental fractures and tongue-biting; minor hemorrhages from nose, ears, or poorly healed abrasions; aspiration of gastric contents; and significant cardiac arrhythmias. Generally these may be avoided by proper procedures or effectively treated by available emergency equipment.

*Common changes after a complete course of ECT* include weight gain (in comparison with pretreatment weight), EEG changes that persist for several months, amenorrhea, and memory impairment that gradually normalizes (see following discussion). The permeability of the blood-brain barrier is temporarily increased, which may significantly alter the effects of certain drugs.

*Rare changes after a course of ECT* include prolonged memory impairment and spontaneous seizures. The latter are unpredictable and have been estimated to occur at a rate of no more than 1 case per 200 patients.

#### Organic Intellectual Impairment Following ECT

An acute organic brain syndrome is the most troublesome side effect in the vast majority of patients treated with ECT. It consists of a confused state following each treatment, variable intellectual impairment, and *amnesia* that may persist for several weeks or months. The degree and duration of these changes are probably affected by: (1) individual predisposition (e.g., preexisting dementia or CNS disease) and idiosyncrasy; (2) electrode placement (bilateral or nondominant unilateral); (3) spacing and total number of treatments; (4) amount of posttreatment hypoxia; (5) total duration of seizures; and (6) total amount of electricity.

The reversibility of memory impairment after ECT has long been a matter of controversy. Occasional patients seem to have significant and long-lasting retrograde amnesia, especially if they received a large number of treatments that were closely spaced. However, controlled

studies have repeatedly failed to detect significant memory impairment persisting beyond a few weeks in the majority of persons receiving a "normal" course of ECT.

In one such study by Squire and Chace (1975), a battery of sensitive tests of memory function was administered to three groups of patients who had been hospitalized and treated for depression 6 to 9 months earlier. Comparing patients treated with bilateral ECT (5-17 treatments), unilateral ECT (5-15 right-sided treatments), and no ECT, the authors were unable to find differences on any of the tests, and no patient in any of the three groups was considered impaired at the time of testing. By contrast, all patients in a control group currently receiving bilateral ECT showed considerable impairment on all tests soon after their sixth treatments.

An interesting additional finding was that 62 percent of the persons treated with bilateral ECT 6 to 9 months previously *rated themselves as still having memory impairment, although no objective evidence of such impairment could be found.* This percentage was significantly higher than in the other two groups studied. The authors suggested several possible explanations for the discrepancy, including the possibility that high levels of initial impairment are followed by a greater tendency to assume that impairment still exists.

#### Maintenance Treatment

Although ECT is an excellent and potentially lifesaving treatment for severe depression, there is a tendency for some patients to relapse a few months later. However, *maintenance antidepressant medication substantially reduces the rate of relapse after completion of ECT.* This is true even among patients whose acute depressions had responded poorly to medication. Some type of follow-up psychotherapy may also be beneficial for patients whose depressions were related to external stress or intrapsychic conflict.