
Electroconvulsive Therapy (ECT) Fact Sheet

Bottom Line:

ECT is one of the most effective treatments in psychiatry, but cognitive side effects understandably make patients reluctant to try it. We should recommend it to any patient with severe treatment-resistant depression or psychosis.

FDA Indications:

Treatment-resistant or severe depression (either unipolar or bipolar); catatonia.

Off-Label Uses:

Psychotic depression; severe schizophrenia; suicidality; neuroleptic malignant syndrome.

Procedure:

- Appropriate leads are placed to monitor cardiac function (via ECG), brain waves (via EEG), muscle activity (via EMG), oxygen blood saturation, and blood pressure and pulse.
- Electrodes are positioned in different areas of the scalp (bilateral, right unilateral, or bifrontal) depending on the patient and the judgment of the psychiatrist.
- Patients receive both an IV anesthetic medication (usually methohexital) to put them to sleep, and a very short-acting muscle relaxant (usually succinylcholine) to relax the muscles and thereby prevent injury during the ECT-induced seizure. Sometimes patients will also receive an anticholinergic medication to prevent bradycardia and oral secretions, as well as a beta blocker to prevent tachycardia.
- Once the patient is anesthetized, an electrical stimulus is delivered through the electrodes. The dose of the stimulus varies and is adjusted based on the patient's seizure threshold (which is determined during the first treatment). The stimulus is delivered via a brief pulse lasting anywhere from 0.5 to two milliseconds.
- Seizures usually last 30–60 seconds.

Pre-ECT Workup: No specific labs are required. There are no absolute medical contraindications. All patients should have a medical consultation prior to ECT.

Cost: \$\$\$

Side Effects:

- Most common: Acute confusion for 30 minutes after each treatment in all patients; persistent memory loss for events occurring during the treatment period and a few weeks before and after (most patients); tension headache (30%); nausea; jaw pain.
- Longer-term memory loss occurs in about 25% of patients.
- Bilateral lead placement (electrodes on both temples) is most effective but also causes more cognitive side effects than unilateral lead placement (electrodes on right temple and scalp apex).
- Pregnancy/breastfeeding: Can be safely administered during pregnancy and lactation.

Mechanism, Treatment Course, and Drug Interactions:

- ECT produces a generalized seizure that has antidepressant/antipsychotic effects via unknown mechanisms—possibly by increasing monoamine neurotransmission.
- Treatments are given two or three days a week, and response usually begins after three to six treatments (one to two weeks). Patients receive seven to 10 treatments on average.
- ECT may be continued on a maintenance basis (typically, weekly ECT for two to four weeks, then tapering down to monthly or as required based on symptoms). Maintenance ECT lasts six months or more, depending on response and side effects.
- ECT can be administered on an inpatient or outpatient basis.
- All psychiatric medications may be continued during ECT. Lithium dose should be decreased to minimize cognitive side effects, and benzodiazepines and anticonvulsants should be withheld the night before ECT so as not to interfere with the seizure.

Clinical Pearls:

- ECT is the most effective treatment for depression, with a remission rate of 70%–90%.
- Elderly patients probably respond better to ECT than younger patients.
- Although ECT can be very effective, relapse rates are high in the months following treatment. Consider maintenance ECT, an antidepressant plus lithium augmentation, or psychotherapy as best approaches to maintain response.

Fun Fact:

The first ECT was conducted in 1938 by Dr. Ugo Cerletti on an Italian engineer who was hallucinating and having delusions that he was being “telepathically influenced.” After 11 high-voltage treatments (without anesthesia), he made a full recovery and was discharged from the hospital.