

# Electroconvulsive therapy

## Background

Electroconvulsive therapy (ECT) has been used since the 1930s. It was originally tried in schizophrenia but it was soon shown to benefit patients with mood disorders. It was originally used without either anaesthesia or muscle relaxants and patients experienced significant injury.

ECT has stimulated mixed opinions both amongst the lay population and the medical profession. Some groups think it is harmful and invades patient autonomy and others feel that it is useful when performed under appropriate circumstances and if the risks and benefits are weighed.

## Procedure

- Electrodes are placed on the skull. They can be placed on one side (unilateral ECT - usually on the non-dominant hemisphere) or both sides (bilateral ECT).
- Patients are given a general anaesthetic and a muscle relaxant.
- Subsequently, an electrical current is delivered to induce a generalised seizure.
- The patient has about 6-12 sessions, approximately twice a week. If the patient responds, then sessions are stopped. Rarely, ECT is used in maintenance therapy, about once a month.

## Method of action

It is unclear how ECT works. However, following functional MRI studies, it is hypothesised that it works within a framework of disruption, brain plasticity and rewiring of neural networks.<sup>[1]</sup>

# Indications

The National Institute for Health and Care Excellence (NICE) recommends ECT for rapid improvement, in the short term, of symptoms in the following: [2]

- Severe depressive illness or refractory depression. [3]
- Catatonia.
- A prolonged or severe episode of mania that does not respond to other treatments. [4]

It should only be used if other treatment options have failed or the condition is potentially life-threatening (eg, personal distress, social impairment or high suicide risk).

- ECT is usually only used in the short term and long-term benefits have not been documented. ECT should stop once a response is achieved or if the patient develops side-effects. Also, if the patient refuses further treatments then ECT should stop.
- Note that ECT might be useful in severe schizophrenia but the potential for cognitive impairment needs careful consideration. [5] [6]
- The cost-effectiveness of ECT use in treatment-resistant depression has been established. [7] [8]

# Decisions to use electroconvulsive therapy

- Decisions to use ECT should only be made by mental health specialists.
- Decisions are based on weighing up the risks and benefits to the patient.
- Risk analysis includes the risk of the anaesthetic, risk of having no treatment and side-effects.
- Elderly patients and children are at increased risk.
- Pregnant women are at an increased risk.

- Decisions should be made in partnership with the patient if possible. The patient must give their consent if they have the capacity to do so. [2] [3] [4]
- If patients are unable to give their consent then the decision will need to be made in the patient's best interests – it may be helpful to involve family and carers for advice. [9] [10]
- ECT in **catatonia**:
  - Catatonia is associated with an alteration in muscle tone which can lead to the absence of movement or excessive movement.
  - There is a high associated morbidity and mortality with catatonia.
  - It is seen in schizophrenia and mood disorders.
  - There is evidence of benefit using ECT for people with catatonia but there is significant underdiagnosis of the condition and accepted protocols or guidelines are absent. [11]
- ECT in **mania**:
  - During a manic episode patients have an elevated mood and increased energy. During a severe episode patients are potentially dangerous to themselves and possibly to others.
  - ECT is occasionally used as a treatment of last resort, and antipsychotics are usually the mainstay of treatment. The evidence for the effectiveness of ECT in treatment-resistant mania is growing. [12]
- ECT in **depression**:
  - ECT is used in severe depressive episodes – eg, depression with delusions and hallucinations. It may also need to be considered if patients become suicidal or homicidal. [13]
  - A systematic review and meta-analysis confirmed that ECT is effective in treatment-resistant depression and may be more effective than drug therapy. [14]

# What is the evidence for the use of electroconvulsive therapy?

Real ECT has been compared with sham ECT. These trials have shown that ECT is more effective in the short term. Also, bilateral treatments are more effective than unilateral. These results have been seen in conditions such as depressive illness and mania.<sup>[2]</sup>

Reviews of trials of schizophrenia and ECT (including a 2019 Cochrane review) have revealed that there is clear benefit but the adverse effects should be considered.<sup>[5]</sup> <sup>[6]</sup> However, there have not as yet been any comparisons between ECT and established antipsychotics - eg, clozapine. Further research is required and needs to include long-term effects, safety and role in certain groups - eg, elderly patients.

## Complications<sup>[15]</sup>

### Immediate

- Cardiovascular instability - eg, arrhythmias and [hypotension](#).
- [Status epilepticus](#).
- Related to the general anaesthetic.
- Laryngospasm.
- Peripheral nerve palsies.
- [Headache](#).
- Nausea.

### Long-term

ECT has (historically) been associated with long-term and short-term memory deficits; however, more recent systematic reviews show a subjective improvement which correlates with the improvement with depression scores.<sup>[16]</sup> There may be some transient amnesia. Similarly prior beliefs about deteriorating cognitive function may be incorrect.<sup>[17]</sup> <sup>[18]</sup>

# Prognosis

Mortality from ECT is no greater than mortality from a general anaesthetic when undergoing minor surgery.

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## Further reading

- [Sinclair DJM, Zhao S, Qi F, et al](#); Electroconvulsive Therapy for Treatment-Resistant Schizophrenia. *Schizophr Bull.* 2019 Jun 18;45(4):730–732. doi: 10.1093/schbul/sbz037.
- [Yahya AS, Khawaja S](#); Electroconvulsive Therapy as a Treatment for Tardive Dyskinesia. *Prim Care Companion CNS Disord.* 2021 May 6;23(3):20r02775. doi: 10.4088/PCC.20r02775.
- [Yahya AS, Khawaja S](#); Electroconvulsive Therapy as a Treatment for Somatization Disorder. *Prim Care Companion CNS Disord.* 2021 May 20;23(3):20r02807. doi: 10.4088/PCC.20r02807.

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