

Factors Affecting Use of Electroconvulsive Therapy in Adolescents in Texas and the US

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Since 1938, electroconvulsive therapy (ECT) has been widely used in the treatment of catatonia, treatment-resistant depression, and severe mania. According to the American Academy of Child and Adolescent Psychiatry (AACAP), criteria¹ for its use in youth is: 1) Presence of severe major depression or mania, schizoaffective disorder, schizophrenia, catatonia, and neuroleptic malignant syndrome. 2) Presence of severe, persistent, and disabling symptoms, such as refusal to eat or drink, severe suicidal ideation, uncontrollable mania, and psychosis. 3) Failure to respond to two adequate trials of medications. 4) ECT can also be used earlier when adequate medication trials cannot be administered because of failure to tolerate pharmacological treatment, or if the patient is incapacitated to the point that he/she is unable to take medication or awaiting a response to a medication poses a grave threat to life.

Worldwide, about one million patients are estimated to receive ECT annually.² The prevalence of ECT use varies across countries for a number of reasons, which include the availability of trained physicians, facilities, equipment, and technique of the procedure (unilateral vs. bilateral application of ECT electrodes).² For example, for all ages of in-patient psychiatry in Thailand, its use is .01%, in Hong Kong 1.8%, and India 13.4%. In the Chinese adolescent population between 2007 and 2013, ECT has been reportedly used in 46.5% of youth with a diagnosis of schizophrenia, 41.8% of youth with major depressive disorder, and 57.8% of youth bipolar disorders.³

In the United States, the utilization rate of ECT for adolescents is 1.5 %.⁴ Key factors responsible for this low rate may be negative stigma in the media, access to the service, and statewide legislation. Many places lack access to provide ECT services, without the presence

of an academic medical center, availability of the equipment, and training or supervision. The negative portrayal of ECT in the media can influence physician's attitudes and knowledge of the procedure, decrease referrals for ECT, and decrease reimbursements from insurance.¹ This negative portrayal may have something to do with the side effects of ECT. Some of those who advocate for limiting its use highlight the potential cognitive side effects seen after ECT. In 1974, government economist Marilyn Rice described cognitive decline following ECT to author Berton Roueche, which he reported in his article "As Empty as Eve".⁵ This description contributed to the negative public perception of ECT. Similarly, in 1990, Linda Andre wrote her experience of memory loss following ECT in horrific terms.⁵ However, the risks of cognitive effects are also present in some surgical interventions, like a coronary artery bypass grafting (CABG), but no surgical procedure is regulated by any court of law and/or consensus opinion sought. Similarly, cognitive decline seen in children after brain tumor surgery also does not need any consensus from different surgeons or require court order.⁶

State laws put barriers in place that significantly limit ECT access and use.⁷ Some states have more general restrictions to ECT, including reporting ECT data to certain state agencies and acquiring mandatory consensus opinion amongst psychiatrists. Other legal requirements make the process more difficult for individual patients, such as requiring a court order or putting age limits for when patients can receive ECT, even if clinically indicated. With a few exceptions, such as Arizona, West Virginia, Maryland, and New Mexico, most states have specific regulations. Please see Table 1 for details of different state laws for ECT. The impact of these laws can be seen in case reports and data showing decreased access and negative patient impact.

Table 1. State Laws Regarding Electroconvulsive Therapy (ECT)	
States	Comments
Idaho, Arkansas, Arizona, New Hampshire, Oregon, Wyoming, Delaware, Florida, Illinois, Kansas, Michigan, Texas, California	Informed consent needed
Colorado	Minimum age: 16 years
Alabama, Alaska, Arizona, Connecticut, Montana, Nebraska, Nevada, Oklahoma, Oregon, Pennsylvania Rhode Island, Vermont	No restriction on age limit
Texas	16-17 years only Registration of equipment and facility with a special consent form required for ECT administration
California	No less than 12 years old Consent of 3 psychiatrists needed for 12-16 years
Idaho	Court order needed for ECT administration
Mississippi	Consent of 2 psychiatrists needed

The data⁸ from 2010 to 2016 ECT reports in Texas shows a significant difference among age groups of ECT use, with only 29 patients (0.17%) being adolescents. We found out that ECT use dropped in California after 1977 legislation.^{9,10} There was also a 50% drop in Massachusetts from 1974 to 1980 because of state legislation.¹⁰ A case study revealed that a 15-year-old boy failed to receive ECT when he moved from Michigan to Texas⁹ as ECT cannot be given to those below 16 in Texas.

In order to address these varied legal and social practices, we need to advocate for effective and safe usage of this treatment by providing a clear rationale for it. AACAP has established practice parameters to address how and when ECT should be used. Informed consent, a second opinion for consensus, and continuation of concurrent treatment are recommended.¹ These parameters are often not followed in the state legislations, which are generally more restrictive. In addition, we would offer that these guiding principles may help lawmakers when they consider how the state will regulate ECT:

Best interests and doing no harm: ECT provides evidence that it improves some patients well-being.¹¹ So far, there are no reported pediatric deaths due to ECT. Fear of impacting neural connections in a young brain is also unfounded. Studies such as

Cohen *et al.*, Taieb *et al.* and Ghaziuddin *et al.* found no difference in social interaction skills of ECT pediatric patients as compared to their non-ECT counterparts.¹¹ In our case above, when a youth moved from Michigan to Texas and no longer was allowed to receive ECT, the failure to continue an effective treatment is a form of harm.

Equal distribution of mental health resources: This applies to availability of trained ECT professionals, including psychiatrists, anesthesiologists, and other associated staff. ECT equipment should also be readily available for use across the country.¹¹ In order to increase the number of trained professionals, ECT training should be a part of psychiatry residency programs. In a survey¹² conducted on 44 residents from the Philadelphia area, residents were given a questionnaire to check their knowledge and comfort regarding the use of ECT. Only 2 residents (7%) indicated confidence in performing the ECT on their own without any supervision. In 2001, the American Psychiatric Association Task Force on ECT recommended¹³ that residents should receive at least 4 hours of didactic lectures, ECT participation in at least 10 treatments, and assist in the care of at least three patients receiving ECT. In another survey,¹² program directors were emailed a questionnaire regarding training in ECT. Seventy-five

percent of program directors reported that some clinical exposure to the ECT was required, while 37% estimated that the typical resident participate in fewer than 10 treatments, and 27% responded that their residents take care in fewer than 5 patients receiving ECT. In yet another survey conducted in Canada, only half of the residents said that they received more than 2 hours of didactic training on ECT. It is imperative that those residents who want to become ECT practitioners should undergo a more dedicated and specialized training during the residency.¹² Didactic teaching should be enhanced with more hands-on exposure to ECT, and those who are in their 4th year of residency especially need to be checked for the ECT skills. There's also a need for making use of technology like video tapes and an outside speaker to fully train the graduating residents.¹² There are reports that if residents are trained through video tapes, it has a positive outcome on the ECT administration.¹⁴

Clarification of indications for treatment:

Evidence supports the use of ECT for catatonia, significant self-injurious behavior, and treatment resistant depression. ECT is indicated in catatonia in children. Although rare, the severity of catatonia warrants early diagnosis and treatment. Patients have severe difficulty in carrying out activities of daily life like washing, dressing, and eating or drinking. It is more common in children with autism spectrum disorders. Consoli *et al.*¹⁵ reviewed 59 cases from 1985 to 2009 and found ECT to be as effective as a second line agent after benzodiazepines. Favorable response was achieved in 45 cases, while 3 had partial recovery followed by 1 non-responder. One case study published by Wachtel *et al.* described an eight-year boy with severe self-injurious behavior who slapped his head and banged his head against his knees at least 109 times per hour. Several medications like haloperidol, quetiapine, and clozapine were tried with little or no success. However, 15 bilateral ECT treatments improved the symptoms drastically with self-injurious behavior reduced

to 19 times per hour.¹⁶ Regarding treatment resistant depression, Ghaziuddin *et al.*¹⁷ evaluated the effectiveness of ECT. Eleven hospitalized adolescents (ages 16.3 ± 1.7 years, 10 females) who had failed to respond to three or more adequate trials of antidepressant medication were examined. After a thorough diagnostic evaluation, ECT was administered to all 11 patients. They showed significant improvement noted in scores on the Children Depression Rating Scale-Revised (CDSR-R) and the Global Assessment of Functioning Scale (GAF) ($p < .05$).

In conclusion, multiple factors may contribute to underutilization of ECT in adolescents in the US. Psychiatrists should know ECT laws in their respective states and refer patients as clinically indicated. In order to continue to increase access to ECT, it is encouraged psychiatrists and psychiatry residents utilize the 3 bullet points above. Psychiatrists need to gain clinical knowledge and skills through the expansion ECT training in residency. Changing public perception and regulations regarding ECT by using evidence showing safety and best practice parameters to combat the false media representation. Advocacy should be done to address the concerns of lawmakers and help them create effective, useful, and safe regulations that do not prohibit its use when clinically indicated. This work may help increase the use of ECT and benefit those suffering from debilitating and incapacitating mental illness.

Take Home Summary

Evidence has shown effectiveness of electroconvulsive therapy (ECT) in treating childhood and adolescents' psychiatric disorders. However, it is underutilized in the US due to strict state laws, negative portrayal in media, decreased availability of equipment, and lack of ECT-trained psychiatrists.

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