

AMERICAN ACADEMY OF CHILD AND ADOLESCENT PSYCHIATRY

Electroconvulsive Therapy in Children and Adolescents:
Brief Overview and Ethical Issues

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Sponsored by AACAP Ethics Committee

1.1.2012

The use of electroconvulsive therapy (ECT) in the <18 years old population is a complex topic that ties together elements of psychiatry, neurology, and ethics. The purposes of this brief discussion are to:

- a) briefly review some clinical issues related to ECT use in minors, and
- b) discuss ethical implications of this procedure in the pediatric population.

Background

The first ECT cases were reported in the early 1940's by Dr. Bour Heuyer, who performed the procedure on teenagers in France with a variety of psychiatric conditions.¹ The first American cases were performed by Dr. Lauretta Bender in 1947, and showed marked improvement in nearly every patient (n=98) suffering from 'childhood schizophrenia.'² Despite the early reports of ECT's effectiveness, objective data and confirmatory literature on the topic remain sparse.^a Nevertheless, average response rates across all available literature reports are impressive: 80% for catatonia, 80% for mania, 63% for depression, and 42% for schizophrenia.⁴ Despite the success, very few minors actually receive ECT. The average ratio of adult-to-minor use is approximately 65:1; although exact numbers are not available for lack of a nationwide reporting system.³ Many child and adolescent psychiatrists have little knowledge, training, or experience in ECT. An attitudes survey (n=625) conducted by Ghaziuddin *et al.* highlighted this knowledge gap: 53% only possessed minimal knowledge about ECT use in minors, 75% lacked the confidence/skill to provide a second consultant opinion, 52% regarded ECT as unsafe in pre-pubertal children, and 26% considered it unsafe in adolescents. However, child psychiatrists clearly seek guidance on the topic since 95% of them favor the use of AACAP practice parameters, and 90% support having a national reporting system.⁵

The 2004 AACAP Practice Parameters on ECT provide practical aspects and guidance for the treating child psychiatrist, and an addendum summarizing those points is listed at the end of this paper.³ No national standard exists with regards to minimum age requirement; certain states have their own individual age restrictions, however. For example, ECT is not permitted for patients younger than age 16 in Texas and Colorado, those younger than age 14 in Tennessee, and those younger than age 12 in California.^{7,b}

^a Prior to 1990, the literature contains sporadic case reports, retrospective case studies, and studies with small sample sizes.³ Thereafter, the studies were more elaborate and used objective outcome criteria, although they were still limited to a retrospective case design.³ Randomization continues to be a difficult proposition. Kutcher and Robertson tried using two arms for ECT and non-ECT treatment; however, since the patients were able to select and/or refuse treatment, the study was neither randomized nor double-blinded.

^b To be considered for ECT, an adolescent must meet criteria involving diagnosis, severity of symptoms, and lack of treatment response. Indicated diagnoses include severe depression with or without psychosis, schizoaffective disorder, schizophrenia, catatonia, and neuroleptic malignant syndrome (NMS). Intensity of symptoms must be severe, persistent, and life threatening, and such examples include refusal to eat or drink, uncontrollable mania, and florid psychosis. Except in the case of utmost urgency, the psychiatrist must document failure of response to at least two adequate trials of psychotropic medications. There are no absolute medical contraindications for ECT for adults or adolescents, and ECT has been successfully used even in patients with cardiac and neurological conditions. Relative contraindications include CNS tumors with increased CSF pressure, recent myocardial infarction, and active pulmonary infection. Pregnancy is not a contraindication. The presence of mental retardation is not a contraindication, and there are reports of successful ECT use across all spectrums of the MR

Ethical principles:

The use of electroconvulsive therapy in adolescents requires careful consideration of the fundamental tenets of medical ethics:

- 1) Autonomy - the patient has the right to refuse or choose their treatment;
- 2) Beneficence - acting in the best interest of the patient;
- 3) Non-maleficence - "first, do no harm," and,
- 4) Justice – how to distribute health resources equally and fairly.

Some of these ethical principles can conflict at times, and the psychiatrist should be cognizant of the extra time that may be required for a consensus.

Autonomy:

Autonomy refers to the patient's right of self-determination and the ability to choose their own treatment course. As with most treatment of pediatric patients, a delicate balance exists between the wishes of the parent (or guardian) and those of the minor child. The 2004 AACAP Practice Parameters require that every attempt be made to educate the adolescent and parents regarding the risks and benefits of ECT. Written informed consent MUST be obtained from the parents, however, it is not an absolute requirement of the adolescent (although, preferably, it should be obtained). This poses an interesting ethical dilemma when parents and children disagree, as the decision may violate the minor's right to autonomy. Every patient being considered for ECT must have a second independent evaluation from a non-treating psychiatrist to ensure that ECT is needed, thereby, guarding against breaches in autonomy by the treating psychiatrist.³ Furthermore, some states specify a mandatory 72-hour waiting period from the time of informed consent to the first ECT treatment.⁷ This is designed to further protect patient autonomy and allow time for reflection on this important decision. Once the procedure begins, the patient or parents can withdraw consent at any time, which emphasizes that autonomy persists through the treatment period.³

Beneficence and Non-Maleficence:

Beneficence involves pursuing helpful treatment for the patient, one that improves his/her well-being. The data suggests that the risk of doing harm to children and adolescents by administering ECT is quite low. ECT is a relatively safe procedure with no reported pediatric deaths due to ECT.⁸ No data exists to suggest that ECT is more dangerous in the child and adolescent population than it is in adults. In fact, the opposite may be true. Adults are more likely than minors to have pre-existing cardiac conditions that could cause an adverse event during ECT.⁸ Children have lower seizure thresholds and longer seizure times than adults, so less electricity can be used in minors.⁸ Some practitioners worry that ECT may negatively impact developing neural connections in a young brain. These fears appear rather unfounded, however, as current literature does not support any long-term damage to the brain. The available studies by Cohen *et al.*,⁹ Taieb *et al.*¹⁰ and Ghaziuddin *et al.*¹¹ found no long-term difference in social functioning or social achievement between ECT and non-ECT pediatric patients. Even at the histopathological level, there appears to be no

population.⁶ ECT may be performed despite comorbid psychiatric conditions, including PTSD, ADHD, personality disorders, eating disorders, and conduct disorder.³ If the patient has a co-current physical illness, the practice parameters recommend a medical consultation prior to ECT initiation.

significant structural change in brains of those treated with ECT.¹² Since there is no evidence of long-term brain damage, withholding ECT treatment could be seen as doing harm to severely psychiatrically ill children and adolescents, as prolonged periods of depression, mania, psychosis, or catatonia can be chronically debilitating.

ECT Ethics and the Media:

The media's portrayal of electroconvulsive therapy as barbaric has seeped deep into the consciousness of the American public.¹³ ECT began appearing in films as early as 1948, in Anatole Litvak's "The Snake Pit." Other early films involving this theme included "Fear Strikes Out" (1956) and "The Shock Corridor" (1963), but it wasn't until "One Flew Over the Cuckoo's Nest" (1975) that the American public became vividly aware of the procedure. The movie depicted Jack Nicholson being electrocuted while forcefully strapped down, mouth guard shoved in place, writhing in pain.¹⁴ In the famous words of Nurse Ratched, the treatment "might be said to do the work of the sleeping pill, the electric chair and the torture rack. It's a clever little procedure, simple, quick, nearly painless; it happens so fast, but no one ever wants another one. Ever." In another best-picture winner, Ordinary People (1980)¹⁴, a teenage boy admits to his coach that he was treated with ECT while in the hospital for depression. The coach quips, "You know, I'm no doctor, Jarrett, but I would never have let them put electricity through my head." Girl Interrupted (1999), another Oscar winner, showed the main actress "Lisa" running away after getting "shocks." A search of the media actually reveals very few films to show ECT in a positive or even neutral light.¹⁴

When thinking about the concept of beneficence and maleficence, we must be mindful that many lack first-hand knowledge about ECT, and their opinions are shaped by media portrayals. Changing the public perception is indeed a daunting task.

Justice:

The concept of justice involves the distribution of scarce health resources, and making sure patients get equal and fair treatment. ECT is still a relatively rare treatment used in the pediatric population, and very few child psychiatrists are formally trained in this procedure. Insurance approval can often be difficult. In Ghaziuddin's survey,⁵ the majority of psychiatrists regarded ECT as a treatment of last resort only. Psychiatrists were more likely to consider medication, hospitalization, and intensive psychotherapy before ECT.⁵ These treatment preferences contrast with the morbidity and suffering associated with a major psychiatric illness. Data indicates that patients and their families overwhelmingly believe that the psychiatric illness is worse than ECT treatment. Justice also involves the equal access to treatment. Each individual state has unique regulations regarding the use of ECT in children. Texas and California are particularly restrictive when it comes to approval for minor treatment with ECT,¹⁵ although a review process does exist for approval. California bars the use of ECT for children less than 12 years old, even for life-threatening conditions.¹⁵ Unequal access to ECT may be seen as a violation of the concept of justice.

The concept of autonomy and justice can sometimes conflict. Fringe interest groups can sue to prevent ECT. In 2010, Watchel et al.¹⁶ reported on a fringe interest group that filed a

lawsuit claiming “torture” with ECT, and asked a judge to have a 15-year old autistic patient forcibly removed from the home. The interest group argued that an autistic adolescent did not possess enough autonomy to consent to the procedure. Ultimately, the family prevailed, and the judge dismissed the claim, but only after significant financial, medical, and legal strains were incurred.

Conclusions:

This brief article reviewed some of the most important ethical tenets involved with ECT administration in children and adolescents. These standards are important in the pre-treatment consent period, during treatment, and in the post-treatment monitoring period. Respect of the patient and family, and commitment to the ethical principles of autonomy, beneficence, non-maleficence, and justice, will help ensure the best outcome. Despite misperceptions among the media, patients and families, and even physicians, ECT is a safe and beneficial procedure, and one with a high response rate. In order to combat years of misperceptions, more education and training is needed so that physicians, patients and families are comfortable considering and utilizing ECT as a treatment when appropriate.

Addendum:

The following information summarizes most recent 2004 AACAP Practice Parameters for Use of Electroconvulsive Therapy with Adolescents.³

Pre-ECT assessment:

The pre-ECT assessment is rigorous and must be thorough. A full psychiatric evaluation must be performed, which should include a detailed clinical interview, collateral information from parents and/or other sources, and target symptom-rating scales, if available. A review of previous treatments should document all pharmacotherapy trials, reasons for discontinuation, consideration of patient non-compliance, and any psychotherapeutic interventions like cognitive behavioral therapy, family therapy, or case management. Even though there are no absolute contraindications, all patients must have a comprehensive physical examination, and relative contraindications must be considered. Laboratory work is only necessary if there is concern for a medical condition. All female patients must have pregnancy testing by urine or blood. Before ECT, every adolescent must have a baseline memory assessment, which should be repeated at treatment termination and again 3-6 months post-treatment to monitor for cognitive decline.³

Procedures during ECT:

A qualified anesthesiologist, who has experience in treating adolescents, should administer anesthesia. The most common anesthetic agent is methohexital, and succinylcholine is used for peripheral muscle relaxation and to minimize muscle seizures. Patient should be given 100% oxygen ventilation before electrical stimulation. The patient’s vitals must be monitored from the pre-treatment period through recovery. During treatment, the patient should be monitored for seizure duration, airway patency, and adverse effects. The most common adverse effects include new memory impairment, tardive seizures (seizures within 24 hours after treatment), prolonged seizures (>180 seconds during treatment), and general anesthesia risks. The fatality rate among adolescents is estimated to be 1.1 per 10,000 cases, similar to the adult rate of 0.2/10,000, with no statistically significant risk difference.³ Minor adverse effects include headache, nausea, muscle aches, and post-

treatment confusion, but these are generally transient and disappear within 24 hours of treatment.³ To date, notably, there have been no child or adolescent fatalities reported in the literature.⁵

Post-ECT:

Immediately after treatment, the patient must be monitored in a recovery area under the supervision of nurses or doctors. In the 24 hours post-treatment, the most life-threatening outcome is the development of tardive seizures. Although ECT is regarded an effective treatment of acute illness, it does not decrease the likelihood of a further relapse. Thus, psychotropic medication should be re-initiated after ECT. There is very little guidance about using maintenance ECT in adolescents.³

ANNOTATED REFERENCES

1. Heuyer G, Bour, F. Electrochoc chez des adolescents. *Ann Med Psychol.* 1942;2:75–84. This article appears to be the first evidence of ECT being reported in adolescents the medical literature. Georges Heuyer and his colleagues reported to the Société Médico-Psychologique of Paris regarding the positive effects of ECT in two teenagers during the German occupation in France. The following year, in 1943, the group reported on ECT treatment in 40 children and adolescents. ECT was most useful for depression, less effective in mania, and not helpful for schizophrenia. ECT was reported to be safe in this age group.
2. Bender L. One hundred cases of childhood schizophrenia treated with electric shock. *Trans Am Neurol Soc.* 1947;72:165–169. This article appears to be the first American literature report of ECT use in children, approximately 100 under the age of twelve years. Most of these children suffered from “childhood schizophrenia” at the time. Bender reported the beneficial effects of ECT in all but two or three, but conceded that complete remission only occurred “in a few.”
3. AACAP Official Action. Practice Parameter for Use of Electroconvulsive Therapy with Adolescents. *J Am Acad Child Adolesc Psychiatry.* 2004;43:12. This is the official AACAP practice parameters from 2004. This article highlights current knowledge about the use of electroconvulsive therapy (ECT) for adolescents with severe mood disorders and other Axis I psychiatric disorder. The authors noted that mood disorders have a high rate of response to ECT (75%-100%), whereas psychotic disorders have a lower response rate (50%-60%). Issues involving consent, state and legal guidelines, and safety concerns were reviewed.
4. Kutcher S, Robertson HA. Electroconvulsive therapy in treatment resistant bipolar youth. *J Child Adolesc Psychopharmacol.* 1995;5:167–175. This article suggested that ECT treatment might be an acutely well tolerated, effective and cost-effective treatment in adolescents with bipolar disorder, in acute mania or a depressive state, or in those who show treatment non-response to optimized psychopharmacologic interventions.

5. Ghaziuddin N, Kaza M, Ghazi N, King C, Walter G, Rey JM, Electroconvulsive therapy for minors: experiences and attitudes of child psychiatrists and psychologists. *J ECT*. 2001; 17:109–117.

This article examined the knowledge, experience, and attitudes towards the use of electroconvulsive treatment in minors among child and adolescent psychiatrists and psychologists. A majority of the respondents stated that they possessed minimal knowledge about the use of ECT in children and adolescents. Lack of confidence in providing a second opinion was common and reported by three quarters of respondents. Compared with those with minimal knowledge, respondents with advanced knowledge reported a higher perception of safety and efficacy. The majority of the respondents regarded ECT as a treatment of last resort.

6. Van Waarde JA, Stolker JJ, van der Mast RC. ECT in mental retardation: a review. *J ECT*. 2001 Dec;17(4):236-43.

This article reviewed the literature on the use of ECT in mental retardation, mostly with psychotic depression. In most cases (84%), ECT was effective and without important side effects. However, relapse occurred frequently, in about half the patients. The reported case studies suggest that ECT may be of value in treating severe psychiatric disorders in mentally retarded patients, with similar indications as in general psychiatry. However, the lack of strong scientific evidence, complicated psychiatric assessment, ethical, and legal issues, probably limits use of ECT in these patients.

7. Herman RC, Dorvart RA, Hoover CW, Brody J, Variation in ECT use in the United States. *Am J Psychiatry*. 1995; 152:869–875.

This study showed that rates of ECT use were highly variable, higher than for most medical and surgical procedures. In some urban areas, access to ECT appears limited. The extent of variation suggests psychiatrists continue to lack consensus regarding the use of ECT. Better data on the effectiveness of psychiatric treatments may lead to a broader professional consensus and may narrow variations in clinical practices.

8. Wachtel LE, Dhossche DM, Kellner CH. When is electroconvulsive therapy appropriate for children and adolescents? *Med Hypotheses*. 2011 Mar;76(3):395-9. Epub 2010 Dec 3.

This study reported that the indications for electroconvulsive therapy in children and adolescents are similar to those in adults, including severe affective, psychotic and catatonic pathology that has proven refractory to psychotropic medications and caused significant functional impairment. ECT may be indicated as well in specific pediatric neurological conditions. Multiple published reports demonstrate the safety and efficacy of ECT in pediatric patients with a wide range of psychopathology. ECT has also been successfully used in youth with autism and other neurodevelopmental disabilities who present with catatonic deterioration. The authors noted that resistance and stigma persist regarding the use of ECT in children and adolescents in both the professional and lay communities, creating barriers to pediatric ECT access. The authors argue that the use of ECT in children and adolescents is appropriate for specific clinical indications, and urge removal of impediments to ECT access in this population.

9. Cohen D, Taieb O, Flament M et al., Absence of cognitive impairment at long term follow-up in adolescents treated with ECT for severe mood disorders. *Am J Psychiatry*. 2000;157:460–462.

Cognitive functions of adolescents treated with ECT for mood disorder were evaluated at long-term follow-up. The authors reported on cognitive testing results on ten subjects treated during adolescence with bilateral ECT, using the California Verbal Learning Test and Squire's Subjective Memory Questionnaire. Cognitive test scores of the patients treated with ECT were similar to those of the comparison subjects and did not differ from norms from the community. Six of the 10 ECT-treated patients reported having had memory losses immediately after the ECT course, but only one complained of subjective memory impairment at follow-up. The authors conclude that adolescents given ECT for severe mood disorder do not suffer measurable cognitive impairment at long-term follow-up.

10. Walter G, Koster K, Rey JM. Electroconvulsive therapy in adolescents: experience, knowledge, and attitude of recipients. *J Am Acad Child Adolesc Psychiatry*. 1999; 38:594-599.

This study involved a 53-item survey was administered by telephone to persons who received ECT before the age of 19 years in the Australian state of New South Wales. Experiences and opinions about ECT were generally positive. The vast majority considered ECT a legitimate treatment and, if medically indicated, would have ECT again and would recommend it to others. The findings are consistent with and complement evidence showing ECT to be an effective and safe treatment for seriously ill adolescents. The mostly favorable experiences and attitudes reported by interviewees could be reassuring to adolescent patients, their families, and treating health professionals when ECT is being considered.

11. Ghaziuddin N, King CA, Naylor MW et al. Electroconvulsive treatment in adolescents with pharmacotherapy-refractory depression. *J Child Adolesc Psychopharmacol*. 1996 Winter;6(4):259-71.

This study examined the effectiveness and safety of ECT in pharmacotherapy-refractory depression in eleven hospitalized adolescents. All eleven patients improved to a clinically significant degree. The Mini-Mental State Examination showed no significant decline in long term cognitive functioning. The potentially serious complication of tardive seizure occurred in one adolescent. Prolonged seizures were noted in 7 of the 11 patients. Pending further research on ECT in youth, it is recommended that ECT should only be administered to youth in hospital settings, that all regularly administered psychotropic medications (including antidepressants) be discontinued before ECT and restarted after the final administration of ECT, and that physicians be aware that 12 treatments are usually sufficient.

12. Coffey EC. The role of structural brain imaging in ECT. *Psychopharmacol Bull*. 1994;3:477–483.

This study looked at adults referred for ECT and reported that they have a greater number of pathological lesions of the central nervous system that were identified by a CT or MRI scan. The author suggests that some of these lesions may affect treatment outcome or

seizure duration. Therefore, an MRI or CT scan may be indicated in some adolescents, if not already completed as part of a workup for treatment-refractory depression.

13. Kellner CH. Electroconvulsive therapy in the media: coming-of-age. *Psychiat Times*. 2008;25(10),12.

This article discussed several examples of recent, reasonable depictions of ECT in the media, and suggests how they could represent a shift in the way that ECT is regarded. "Depression: Out of the Shadows," by Larkin McPhee," aired on public television, and depicted a Yale surgeon who had positive treatment for his refractory depression. Two recent books about ECT, "Shock Therapy: A History of Electroconvulsive Treatment in Mental Illness," by Edward Shorter and David Healy, and "Shock: The Healing Power of Electroconvulsive Therapy," by Kitty Dukakis and Larry Tye, helped correct some of the public misperception about ECT. The author noted that positive media portrayals are helpful for patients because they are more likely to be open to considering it as a therapeutic option when a psychiatrist suggests it.

14. McDonald A, Hollywood WG, *et al*. Hollywood and ECT. *International Review of Psychiatry*. 2009;21(3):200-206.

This study highlighted that electroconvulsive therapy has been featured in Hollywood films for sixty years. Film depictions continue to exert a powerful and predominantly negative effect on public attitudes towards the treatment. While initially portrayed as a dramatic but effective psychiatric intervention, ECT on film has come to stand for something quite different, representing the brutal and generally futile attempts of society to control and suppress the individual. Thus authors note that filmmakers have been influenced more so by films such as *One Flew Over the Cuckoo's Nest* than by evidence of the safety and effectiveness of ECT as a psychiatric treatment. The authors suggest filmgoers with no personal or professional exposure to the treatment may fail to make the distinction between the demands of film narrative and clinical reality.

15. Winslade W, Liston E, Ross J. Medical, Judicial, and Statutory Regulations of ECT. *Am J Psychiatry* 1984;141:1349-1355.

This study compared the standards for ECT recommended by an APA task force report and those embodied in federal court orders and state statutes and regulations. The authors conclude that in spite of comprehensive safeguards promulgated by the psychiatric community, overregulation by legislatures and courts is commonplace. The authors suggest that legal standards can result in delays or denials of service while failing to resolve critical legal issues involving competence and consent.

16. Wachtel L, Griffin M, Reti I. Electroconvulsive therapy in a man with autism experiencing severe depression, catatonia, and self-injury. *J ECT*. 2010;Mar26(1):70-73.

The authors report the successful use of electroconvulsive therapy in a 19-year-old man with autism and mild mental retardation who developed severe depression with repeated suicide attempts, multiple symptoms of catatonia, and life-threatening repetitive self-injurious behaviors. After three years of failed psychotropic and behavioral interventions in inpatient settings, the patient demonstrated excellent remission of symptoms with bilateral electroconvulsive therapy.