



IN-DEPTH REPORT

ELECTROCONVULSIVE THERAPY TODAY

Irving M. Reti, M.B.B.S., is the director of the *Electroconvulsive Therapy Service* at The Johns Hopkins Hospital and an assistant professor in the Department of Psychiatry and Behavioral Sciences at The Johns Hopkins University School of Medicine. He has received numerous honors in his distinguished career, including The Johns Hopkins University School of Medicine Clinician Scientist Award, and his research work is funded by the National Institutes of Health. His research papers have been published in such medical journals as *Neuropsychopharmacology*, *the Journal of Neurochemistry*, and *the European Journal of Neuroscience*.

Dr. Reti hails from Sydney, Australia, where he earned his M.B.B.S. (Bachelor of Medicine and Bachelor of Surgery—the equivalent of an M.D. in the United States). He moved to the United States to do his psychiatry residency at Johns Hopkins and served as chief resident.



Electroconvulsive therapy (ECT) is hands-down the most controversial treatment in modern psychiatry. No other treatment has generated such a fierce and polarized public debate. Critics of ECT say it's a crude tool of psychiatric coercion; advocates say it is the most effective, lifesaving psychiatric treatment that exists today.

The truth is that modern-day ECT is a far cry from the old methods that earned ECT its sinister reputation. For many of you reading this, the thought of ECT conjures up images of the 1975 movie "One Flew Over the Cuckoo's Nest," with Jack Nicholson thrashing about, forced against his will to endure painful, violent seizures. This is not an accurate portrayal of how ECT is used today. The treatment has evolved into a relatively painless procedure with proven effectiveness in the fight against depression. It has survived its critics because it is safe and because it works.

Today, much of the opposition to ECT seems political in nature and originates in the anti-psychiatry groups that even oppose the use of antidepressants for the treatment of depression. These groups inaccurately perceive ECT as invasive and brain damaging and insist that no reasonable person can give an informed consent for such a treatment. Attacks on ECT continue to be featured on the Internet, on television and radio talk shows, and in newspaper articles. These fuel the public's fears and misperceptions regarding the treatment.

Among psychiatrists, there is little controversy about ECT. The National Institute



IN-DEPTH REPORT

Electroconvulsive Therapy Today

of Mental Health, the American Psychiatric Association, the American Medical Association, and the U.S. Surgeon General all endorse ECT as a valuable tool in the treatment of certain psychiatric disorders, including depression.

ECT involves passing a carefully controlled electrical current through a person's brain to trigger a seizure—a rapid discharge of nerve impulses throughout the brain. The electricity is passed between two electrodes that are placed on the patient's scalp.

Depending on the location of the electrodes, ECT is defined as bilateral or unilateral. In bilateral ECT, one electrode is placed on the left side of the head, the other on the right side. In unilateral ECT, one electrode is placed at the top (vertex) of the head and the other typically on the right side. (The differences between bilateral and unilateral ECT are discussed further on page 29.) When the current is passed between the electrodes, a generalized seizure is produced in the brain. The seizure usually lasts for 30 to 60 seconds.

ECT is sometimes referred to as *shock therapy*, but this is a misnomer. People who undergo ECT today feel no electric shock because they are unconscious during the procedure. A better term for ECT is “seizure therapy,” because the effect of

THE HISTORY OF ELECTROCONVULSIVE THERAPY

ECT was first used in the 1930s. At first, researchers injected chemicals in people with mental disorders to induce seizures, but the chemicals were soon replaced by electrical currents.

Because of ECT's obvious effectiveness and the lack of alternate treatments, it was used widely in the decades preceding the introduction of antidepressant medications in the 1950s. In those early years, ECT was administered without anesthesia or muscle relaxants, and the electrical current was much higher than what is used today. The therapy could therefore be painful and risky. Violent seizures would cause the body to thrash with a force great enough to break bones.

ECT is very different today, although it does still pose a risk of side effects, such as confusion and memory loss. The therapy is far more refined, with carefully calculated electrical currents administered in a controlled medical setting to achieve maximum benefits with minimal risks.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

the electrical current is to induce a generalized seizure. Even the term *electroconvulsive* is misleading, given that drugs are used to suppress the convulsions (powerful involuntary muscle contractions) that typically accompany a seizure.

Regardless of its name, the bottom line is that ***ECT is far and away the most effective treatment that currently exists for depression.*** The recent resurgence of interest in the procedure is therefore not surprising.

Depression is such a pervasive problem, and the medications available today do not come anywhere close to ECT in terms of effectiveness. Doctors who perform ECT essentially treat people who are medication resistant or who have suboptimal responses to the medicines, and about 85% of these difficult-to-treat patients improve with ECT. This is a remarkably high response rate in a severely depressed group of people.

Moreover, the rapid response most patients have to ECT—sometimes as fast as after the first or second treatment—makes it incredibly valuable. There are many situations where this is necessary. When a patient is suicidal, for example, you can't wait around for several weeks while a drug takes effect. ECT is therefore often the first-line treatment in an emergency, especially when a person is suicidal, psychotic, not eating, or catatonic (immobile).

Some 100,000 Americans undergo ECT treatments each year. Deciding whether ECT is a good treatment option for you or a loved one—and whether it should be your first-line treatment or your last resort—can be a difficult decision.

The following are questions I'm frequently asked by patients and physicians about ECT. The answers should help you make an informed decision about the treatment.

Q. When is ECT an appropriate treatment?

A. ECT is generally recommended for people with severe depression (accompanied by psychosis, suicidal intent, or refusal to eat), especially if it is resistant to medications. It is also used for mania that has not improved with medications and for schizophrenia (when symptoms are severe or medications are inadequate).

Focusing exclusively on depression, the first situation in which ECT is extremely advantageous is when a person is acutely suicidal, because the quick response to ECT is crucial. People can begin to respond even after the first treatment or two.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

People who have had ECT before and responded well are good candidates for ECT. Other first-line indications for the procedure include people who are catatonic or suffering from a form of depression known as psychotic depression (depression associated with delusions and hallucinations).

But the main group of people who undergo ECT are those who suffer from severe depression that is not responding to any medications.

One of the issues always associated with medication-resistant patients is whether they have had adequate drug trials—“adequate” means a medication is taken at

IS ECT RIGHT FOR YOU OR YOUR LOVED ONE? FIVE QUESTIONS TO ASK YOURSELF

1. *Is fast symptom relief crucial?* If a person is acutely suicidal, is so depressed that he/she refuses to eat or drink, or experiences delusions or hallucinations that put him at risk for hurting himself or others, there is not time to wait for antidepressants to take effect. In these emergency situations, ECT can offer faster benefits than medications.

2. *Have several antidepressants been ineffective?* When a person has failed two or three adequate trials of antidepressant medications (and possibly psychotherapy as well), ECT is a feasible option. “Adequate” means a medication is taken at high enough doses for a long enough period of time to give it a real chance to be effective.

3. *Is taking antidepressants out of the question?* Some people experience intolerable side effects from antidepressants, even at the lowest possible therapeutic doses. For these people, medications are not an option. Antidepressants may potentially be dangerous to women who are pregnant and want to avoid exposing their unborn child to psychiatric medications. ECT is a viable option for pregnant women.

4. *Have you had ECT in the past and responded well to it?* If ECT successfully treated your depression in the past, it makes sense to stick with a treatment that you know has worked for you previously.

5. *Have you failed to respond to other treatments in the past?* If you’ve suffered from depression in the past and could not find an effective treatment, it may be time to consider ECT for your current depression.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

high enough doses for a long enough period of time to give it a real chance to be effective. If a patient has had two or three adequate trials of medications from different classes of antidepressants (a drug is categorized in a class based on how it works, i.e., drugs in different classes work differently) and failed on all of them, then ECT is warranted.

Q. How does ECT work?

A. Depression is believed to be caused by an imbalance in the brain's chemical messenger system. ECT works to rebalance that system. But exactly how it accomplishes this remains a mystery to neuroscientists and psychiatrists. Many rodent studies have been conducted in hopes of better understanding ECT's mechanism of action, but they have not been informative in any definitive way.

What we do know is that, despite the increase in brain activity that characterizes the induced seizure, there is a net decrease in activity in certain areas of the brain (the prefrontal cortex, for example) following ECT. One hypothesis is that, by inducing a seizure—the absolute strongest stimulus the brain can take—there is a consequent dampening down of brain circuits afterward. This quieting of the brain, it is thought, may help alleviate symptoms of depression.

New research in rodents is evaluating whether ECT may change the structure of the synapse—the small gap between nerve cells where the brain's chemical messengers play such an important role. Changes to the synapse would affect memory, learning, and mood. But this avenue of research is still preliminary.

Q. What should a person expect when undergoing ECT? What preparation is required?

A. Before the first ECT treatment, a patient will have a thorough psychiatric evaluation as well as a complete physical exam. The patient must also sign informed consent documents authorizing the use of ECT. “Consent” means that you understand the procedure as well as its risks and benefits. (See pages 33–35 to review the informed consent forms we use at Johns Hopkins.)

If a patient is unable to provide written consent, state or local laws may allow the appointment of a legal guardian who can approve the procedure on the patient's behalf, if the treatment is deemed medically necessary.

ECT can be performed in an inpatient or outpatient setting. It is typically conducted in the presence of at least two physicians, a psychiatrist, and an anesthesiologist. Because it is done under general anesthesia (a very short-



IN-DEPTH REPORT

Electroconvulsive Therapy Today

acting barbiturate), food and drinks must be avoided for eight to 12 hours before the procedure. For this reason, it is usually given first thing in the morning, before breakfast.

After the patient is put to sleep by an anesthesiologist and immobilized with a muscle relaxant (succinylcholine), electrode pads about the size of a silver dollar are placed on two areas of the scalp. A short, controlled set of electrical pulses is then passed between the electrodes by a machine designed for this purpose. The current lasts only for a couple of seconds, and the resulting seizure lasts for 30 seconds to a minute. Vital signs—heart rate, blood pressure, and breathing—are monitored throughout the procedure.

Brain activity is also monitored throughout the procedure and is recorded on an electroencephalogram (EEG) in a similar way that an ECG measures a person's heart's activity. A sudden increase in activity on the EEG signals the beginning of the seizure; a leveling off shows the seizure is over. A generalized seizure must be induced in order for ECT to be effective.

Because patients are under anesthesia and have taken muscle relaxants, they do not feel the current and convulse minimally during the treatment. The only outward sign that the patient is having a seizure may be a rhythmic movement of a foot or a hand.

Q. What should a person expect immediately following ECT?

A. Patients awaken three to five minutes after the treatment is over. For anywhere from five to 45 minutes, patients may experience a period of acute post-treatment delirium. They are typically very confused, and some experience headache, muscle stiffness, and disorientation.

The majority of patients are not agitated when they wake up, but for the 10% to 20% who are, a short-acting benzodiazepine or Haldol (haloperidol) is given. Patients' alertness and orientation typically return to normal over the next hour.

If ECT is done on an outpatient basis, a family member or friend must drive the patient home after the procedure (driving is not allowed in the 24 hours following an ECT session) and stay until he or she goes to sleep that night.

Q. What are the common side effects?

A. In addition to the immediate side effects of the procedure (see question above), a person may temporarily experience difficulty acquiring new information.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

It is possible to lose memories formed before the procedure as well. But these learning and memory problems usually return to normal within a few weeks or months following the final ECT treatment.

Memories of events immediately surrounding an ECT session may be lost permanently, however.

Q. Perhaps the biggest concern among patients is memory loss. Can you elaborate on ECT's effects on memory?

A. Memory loss is indeed one of the greatest concerns of people who receive ECT, and rightfully so. Most patients experience some permanent loss of memory for events during the treatment and a few days to weeks before.

Although it's difficult to tease out which memory deficits are caused by the depression (depression is, after all, a disease associated with damaging cognitive effects) and which are caused by ECT, it is clear that both *retrograde memory*—the recall of events that occurred before the treatment—and *anterograde memory*—the ability to absorb new knowledge afterward—deteriorate as ECT treatment progresses.

The ability to acquire new memories typically resolves after a few weeks, but retrograde memory deficits may take longer and may not completely resolve in some patients. The risk of more severe and long-lasting memory loss is a heavily debated topic, but most studies report that it is uncommon.

One such study, conducted by researchers at the New York State Psychiatric Institute, took a long-term look at ECT's effects on memory and intellectual functioning in several hundred patients. Before treatment, participants were given tests of retrograde and anterograde memory as well as overall cognitive functioning, attention, and reaction time. They also answered a questionnaire on autobiographical memory. After treatment and then again six months later, the participants were given these same tests.

By the end of the course of ECT, most patients' test scores had declined. But six months later, most patients rebounded and were scoring better than before treatment. This shows just how debilitating the effects of severe depression can be on the brain. (In fact, other studies have shown that patients whose depression responds best to ECT have the fewest memory complaints.)

Unfortunately, only most patients rebounded, not all. Some still scored worse than before ECT on the autobiographical memory test. And on that test, just



IN-DEPTH REPORT

Electroconvulsive Therapy Today

over 10% of the patients showed severe deficits. Women and elderly people appeared to be most vulnerable.

I must point out that many of these studies have been done with *bilateral ECT*—the standard placement of electrodes at the temples on opposite sides of the head. But nowadays, many doctors prefer to place the electrodes on the same side of the head (usually the right side)—called *unilateral ECT*—because it has been proven to minimize memory side effects.

Some practitioners think unilateral ECT is less effective than bilateral ECT, but others—and I put myself in this category—believe that if the dose of electricity is adequate, unilateral can work just as well as bilateral (for depression) with far fewer memory side effects.

Several years ago, Harold Sackeim, Ph.D., of the New York State Psychiatric Institute—the premier researcher in ECT—published a randomized, double-blind comparison of bilateral and right unilateral ECT in the *Archives of General Psychiatry*. He found that high-dosage unilateral ECT is as effective as bilateral ECT but produces less severe and less persistent cognitive deficits.

Dr. Sackeim just published another study in the journal *Neuropsychopharmacology* (February 2007) confirming his previous findings. Before this, there had never been a large-scale, prospective study of the cognitive effects of ECT.

The study concluded that bilateral ECT resulted in more severe and persistent retrograde memory loss than right unilateral ECT. Patients treated exclusively with bilateral ECT showed 3.4 times the memory loss immediately after ECT and 2.8 times the memory loss six months after ECT.

Despite the ongoing controversy regarding the extent to which memory loss is associated with how ECT is administered (bilateral vs. unilateral), the evidence shows that ECT's adverse cognitive effects can be significantly reduced by using advanced techniques.

Some practitioners think unilateral ECT is less effective than bilateral ECT, but others—and I put myself in this category—believe that if the dose of electricity is adequate, unilateral can work just as well as bilateral for depression with far fewer memory side effects.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

Q. Are there any serious risks from treatment? Does ECT cause brain damage?

A. All medical treatments have an element of risk. ECT carries no more risk than having minor surgery under general anesthesia. For some people, ECT is actually safer than taking antidepressant medications.

There have been many myths about ECT causing brain damage. Studies using magnetic resonance imaging (MRI) of the brain show that ECT does not change brain anatomy in any way.

Q. How many treatments are needed?

A. Typically, ECT is given two to three times a week for a total of six to 12 sessions.

Q. How well does ECT work?

A. Studies have shown ECT to be effective in 80% to 85% of the patients who receive it.

ECT is very well studied. Researchers have used several controls for comparison, such as “sham” ECT (all the elements of the procedure but without the electric stimulus), tricyclic antidepressants, monoamine oxidase inhibitors, combinations of antidepressants and neuroepileptics (anticonvulsants), and placebos.

Some studies have found ECT to be at least as effective as medications, but others have found it to be superior. Specifically, data show that patients respond positively to medications 40% to 70% of the time but may require several trials of different medications. In contrast, ECT has a response rate of 80% to 85%, even though it is typically not even attempted until other treatments have failed.

Not one controlled study has ever shown another form of treatment to be better than ECT in the short-term management of severe depression.

It is important to note that most published studies were not designed to assess the efficacy of ECT beyond the short term. Evidence shows that relapse rates in the year following ECT are typically high unless maintenance antidepressant medications (or maintenance ECT) are prescribed. (See “What are the relapse rates?” on the next page.)

Research also shows that most people who have had ECT were glad they had received the treatment, felt safe having it, and would choose ECT again in the



IN-DEPTH REPORT

Electroconvulsive Therapy Today

future if recommended by a psychiatrist. (See “How Distressing is ECT to patients?” below.)

Q. How soon after ECT do people generally see improvements?

A. ECT works much faster than medications. On average, ECT takes two to three weeks to take effect. By contrast, medications usually take six to eight weeks for improvements to become apparent.

Although some people feel significantly better after just one or two ECT treatments, this improvement is not typically sustained, especially if antidepressant medications are not given afterwards. ECT typically requires six to 12 treatments spread out over several weeks.

Q. What are the relapse rates?

A. ECT is not a cure. Its major limitation is that its benefits are often short-lived. Without maintenance drug therapy following ECT, virtually all patients would relapse within six months.

Of course some people undergo ECT precisely because they can't take medications. This is most common in elderly patients. In these cases, I recommend maintenance ECT to avoid relapse. The medical literature shows that maintenance ECT is an effective, well-tolerated, and cost-effective way to reduce relapse, particularly in the elderly.

If patients can tolerate medications, they are prescribed an antidepressant following ECT, even if they have failed on medications in the past and even if maintenance ECT is prescribed. Many people who undergo ECT do so while they remain on medication. The two treatments are not mutually exclusive.

Q. What does maintenance ECT involve?

A. A typical maintenance ECT regimen would be a treatment once a month, or two or three treatments in a row every six weeks.

Q. How distressing is ECT to patients?

A. Memory side effects are a definite source of distress for some patients. And while there are clearly patients who perceive ECT as terrifying, most speak positively about the procedure after having it.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

NEW RESEARCH: ECT IMPROVES QUALITY OF LIFE

Health-related quality of life (HRQOL) is a measure of a person's perceived physical and mental health over time. People with major depression suffer from poorer HRQOL than people with hypertension, arthritis, angina, or other common medical conditions. Not surprisingly, HRQOL is especially compromised in severely depressed patients who are referred for ECT.

It is well established that ECT has powerful antidepressant effects, but little is known about how much those effects impact a patient's HRQOL over the long term. In a recent study in the *Journal of Affective Disorders*, researchers in New York City measured HRQOL in 283 patients with treatment-resistant depression before ECT, several days after ECT, and 24 weeks after ECT. They did so by administering a questionnaire known as the Medical Outcomes Study Short Form-36, which measures physical functioning, vitality, emotional and physical health, mental health, bodily pain, and general health.

Both immediately after ECT as well as several months later, researchers found a significant improvement in HRQOL in people whose depression went into remission after ECT. These findings can be added to the list of ECT benefits. Although many patients (and even some physicians) try to avoid ECT, it is a valuable tool for alleviating depressive symptoms and improving quality of life.

In an article published in the *Journal of the Royal Society of Medicine*—and aptly titled “Are Patients Shocked by ECT?”—72 consecutive patients treated with ECT for severe mental illness were asked their opinions about the procedure: **83% considered they had improved as a result of the treatment, and 81% would have it again. Most found the experience neutral or pleasant, and 54% considered a trip to the dentist more distressing.**

Q. Can ECT be refused by a patient?

A. Yes. As long as you have the legal capacity to make your own decisions, ECT cannot be given without your consent.

Of course the vast majority of patients do give consent. For those who can't because they are too ill, the legal guardian can approve the procedure on the patient's behalf. If a patient has no legal guardian and is unable to give

(continued on page 36)



IN-DEPTH REPORT

**THE JOHNS HOPKINS HOSPITAL
DEPARTMENT OF PSYCHIATRY AND
BEHAVIORAL SCIENCES**

ECT INFORMATION

for addressograph plate

My doctor has recommended that I receive treatment with Electroconvulsive therapy (ECT).

I understand that there may be other treatments for my condition, including medications and psychotherapy, and that whether ECT or another treatment is most appropriate depends on a person's prior experience with these treatments, the nature of their psychiatric condition, and other considerations. My doctor has explained why ECT has been recommended for my specific case.

The potential benefit of ECT for me is that it may lead to improvement in my diagnosis as outlined on the ECT Consent. ECT has been shown to be a highly effective treatment for my condition. However, not all patients respond equally well. As with all forms of medical treatment, some patients recover quickly; others recover only to relapse again and require further treatment; while still others fail to respond at all.

PROCEDURE

ECT involves a series of treatments. For each treatment, I will be brought to a specially equipped room in this hospital. The treatments are usually given in the morning, before breakfast. Because the treatments involve general anesthesia, I will have had nothing to drink or eat for at least 6 hours before each treatment, unless special orders have been written by my doctor for me to receive medicines with a sip of water. An intravenous line will be placed so that I can be given medications as part of the procedure. One of these will be an anesthetic drug that will quickly put me to sleep. When I am asleep, I will be given a second drug that will relax my muscles. Because I will be asleep, I will not experience pain or discomfort during the procedure. I will not feel the electrical current, and when I wake up I will have no memory of the treatment.

To prepare for the treatments, monitoring sensors will be placed on my head and chest. Blood pressure cuffs will be placed on one arm and one ankle. This will enable the physician to monitor my brain waves, my heart, and my blood pressure. These recordings involve no pain or discomfort.

After I am asleep, a small, carefully controlled amount of electricity will be passed between two electrodes that have been placed on my head. Depending on where the electrodes are placed, I may receive either bilateral ECT or unilateral ECT. In bilateral ECT, one electrode is placed on the left side of the head, the other on the right side. In unilateral ECT, both electrodes are placed on the same side of the head, usually on the right side. When the current is passed, a generalized seizure is produced in the brain. Because I will have been given a medication to relax my muscles, muscular contractions in my body that would ordinarily accompany a seizure will be considerably softened. I will be given oxygen to breathe. The seizure will last for approximately 1 minute.

RECOVERY

Within a few minutes, the anesthetic drug will wear off and I will awaken. I will be brought to a recovery room, where I will be observed until I am ready to leave the ECT area.

NUMBER OF TREATMENTS

The number of treatments that I will receive cannot be predicted ahead of time. The number of treatments will depend on my psychiatric condition, how quickly I respond to the treatment, and the medical judgement of my psychiatrist. Typically, 6 to 12 treatments are given. However, some patients respond slowly and more treatments may be required. This consent authorizes 18 treatments, except that if I am a patient receiving maintenance ECT, this consent authorizes me to receive treatments for 6 months. This consent authorizes treatment only for this current hospitalization and/ or episode of outpatient ECT and does not authorize further treatment in a subsequent hospitalization or episode of outpatient ECT even though I have not received a total of 18 treatments, except if this Consent is for maintenance ECT as noted above. Treatments are usually given three times a week, but the frequency of treatment may also vary, depending on my needs. I may choose to end the treatments at any time.



IN-DEPTH REPORT

RISKS

As with all forms of medical treatment, there is a possibility of some side-effects of treatment. I may have a headache, muscle soreness, or nausea. These side effects usually respond to simple treatment. Minor irregularities in heart rate and rhythm often occur. Very rarely, myocardial infarction (heart attack) or stroke can occur. Dislocations or bone fracture occur extremely rarely. There is a slight risk of damage to fragile teeth. As with any general anesthetic procedure, there is a remote possibility of death. It is estimated that fatality associated with ECT occurs approximately 1 per 10,000 patients treated.

To reduce the risk of medical complications, I will receive a careful medical evaluation prior to starting ECT. To reduce risk of dental complications, a soft rubber guard will be inserted in my mouth before the treatment is administered.

However, in spite of precautions there is a small chance that I will experience a medical complication. Should this occur, I understand that medical care and treatment are available. I understand, however, that neither the institution nor the treating physicians are required to provide long-term medical treatment. I shall be responsible for the cost of such treatment whether personally or through medical insurance or other medical coverage. I understand that no compensation will be paid for lost wages or other consequential damages.

MEMORY PROBLEMS

Individuals vary considerably in the extent to which they experience confusion and memory problems during and shortly following treatment with ECT. Many patients actually report that their learning and memory functioning is improved after ECT, compared to their functioning prior to the treatment course. Memory difficulties are most common in the period just after treatment. As time passes following treatment, memory functioning improves. Shortly after the course of ECT, I may experience difficulties, remembering events that happened before and while I received ECT. Gaps in memory for past events may extend back to several months before I received ECT, and in rare instances, up to 1 or 2 years. Many of these memories will return during the first several months following the ECT course.

In addition, for a short period following ECT, I may experience difficulty in learning and remembering new information. This difficulty in forming new memories, if it occurs, should be temporary and will most likely subside within several weeks following the ECT course.

A small minority of patients, perhaps 1 in 200, report severe problems in memory that remain for months or even years. The reasons for these rare reports of long-lasting impairment are not fully understood. I may be left with some permanent gaps in my memory, particularly for events occurring close to the ECT treatment.

Right unilateral ECT (electrodes on the right side) produce less memory impairment than bilateral ECT (one electrode on each side of the head). Depending on my clinical response, lead placement causing some increase in the risk for memory impairment, as previously described, may be changed by my doctor.

Because of the possible problems with confusion and memory, it is important that I not make any important personal or business decisions during the ECT course. This may mean postponing decisions regarding financial or family matters. After the treatment course, I will begin a convalescence period, usually 1 to 3 weeks, but which varies from patient to patient. During this period I should refrain from driving, transacting business, or other activities for which impairment of memory may be problematic until I am advised by my doctor that I am ready to do these things.

FURTHER QUESTIONS

I understand that I should feel free to ask questions about ECT at this time or at any time during the ECT course, or thereafter, from my doctor or from any other member of the ECT treatment team. I also understand that my decision to agree to ECT is being made on a voluntary basis, and that I may withdraw my consent and have the treatments stopped at any time.



IN-DEPTH REPORT



THE JOHNS HOPKINS HOSPITAL
DEPARTMENT OF PSYCHIATRY AND
BEHAVIORAL SCIENCES

ECT CONSENT

for addressograph plate

I, the undersigned, understand the potential benefits as well as the potential risks involved in treatment of my diagnosis of _____ by means of Electroconvulsive Therapy. I acknowledge that Dr. _____ has explained the purpose of the procedure, the risks/benefits of the procedure, the alternatives with the risks and benefits and the possibility of complications. I have read the attached information or it has been read to me and all my questions regarding this procedure have been answered to my satisfaction.

I hereby give my consent and authorize and request the staff of the Johns Hopkins Hospital to give a series of electroconvulsive treatments to me. My doctor intends to begin the treatment course with one of the following (circle one):

1. Unilateral Treatments (specify right or left: _____)
2. Bilateral Treatments

Depending on my clinical response, my doctor may alter lead placement during the treatment series.

If during the course of treatment other conditions arise which, in the best judgement of the medical staff, require emergency treatment, I authorize and request the said treatment be performed. I further understand that no guarantee of any results has been made.

I consent to the admission of medical students and other authorized observers during the treatment, in accordance with ordinary practices of this hospital. I have read carefully, and I understand, the foregoing.

Signature of Patient:

Signature of Witness:

Signature of Physician/Health Care Provider Securing Consent:

JHH ID NO.

IF PATIENT UNABLE TO SIGN OR IS A MINOR < COMPLETE THE FOLLOWING:

Patient is a minor (___ years of age) or is unable to sign because _____

Signature of Parent, Surrogate, Health Care Agent or Legal Guardian

Signature of Witness

****TIME OUT VERIFICATION**** Please document the names of the participants below.

Physician/Licensed Health Care Provider

Nurse

Anesthesiologist/CRNA

DATE: _____ TIME: _____ AM/PM



IN-DEPTH REPORT

Electroconvulsive Therapy Today

informed consent (e.g., the patient is catatonic), a psychiatrist can get a court order to perform the procedure.

The informed consent documents we use at Johns Hopkins can be reviewed on pages 33–35.

Q. Are there age restrictions for ECT?

A. No. The majority of our ECT patients at Johns Hopkins are over age 60, and the oldest patient I have treated was 94. Despite the fact that older people tend to have multiple serious illnesses, there is some evidence that older people actually respond better than younger people to ECT.

The youngest patient I have ever treated with ECT was 18. ECT is used for adolescents, but it is rare. The American Academy of Child and Adolescent Psychiatry says that ECT should be considered for an adolescent when the symptoms are severe or the patient has not responded to two antidepressant drugs. Both the patient and his or her legal guardian must give consent.

Q. What medical conditions require special consideration when undergoing ECT?

A. There are few medical conditions that prohibit the use of ECT. Even people with pacemakers can safely have the procedure.

All patients who undergo ECT experience a temporary rise in blood pressure during the treatment. This is controlled by beta-blockers and nitroglycerin administered by the anesthesiologist. But it means that patients with high blood pressure or other cardiovascular conditions should have a consultation with a cardiologist prior to having ECT to make sure their condition is well controlled. The same holds true for people with glaucoma, for which intraocular pressure (which is related to blood pressure) is an issue.

Many of our patients have diabetes. This is an issue because patients are not allowed anything to eat or drink after midnight the night before treatment. Consequently, we have to adjust their dose of insulin or oral hypoglycemics (to half or perhaps none) before treatment.

ECT is often a treatment of choice in severely depressed pregnant women who don't want to expose the fetus to antidepressant medications. We monitor the fetal heart rate before and after the procedure, and the patient of course consults with an obstetrician. ECT is safe for pregnant women.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

CASE STUDY: ELECTROCONVULSIVE THERAPY

A 73-year-old woman with no prior psychiatric history began to feel increasingly uneasy and fearful. Her sleep was disturbed, and she had neither the energy nor the interest to participate in her usual social activities with her church group. After several months of feeling this way, her primary care physician started her on 20 mg a day of fluoxetine (Prozac). A precipitous worsening of her symptoms followed, and she became unable to leave her house, feeling convinced that her sister—who was in good health—was in imminent danger of dying. Soon, she would not eat without a great deal of encouragement, and she needed help with basic daily activities, such as bathing. Believing that she could not be safely treated at home, her physician referred her to the hospital for inpatient treatment.

Once hospitalized, the patient's medication was changed from fluoxetine to nortriptyline (Aventyl, Pamelor), one of the tricyclic antidepressants. However, she continued to exhibit severe symptoms of depression, including marked changes in her mood, sleep, appetite, energy, and ability to interact with others. She remained convinced—and

distressed—that her sister was in danger. Because her symptoms were so severe and the expected time for the new antidepressant to take effect was not for another four to six weeks, the treating physicians recommended electroconvulsive therapy (ECT).

Both the patient and her family were initially wary of this treatment, mainly because of what they had read and seen in old movies. In particular, they were worried that she would be uncomfortable and lose a substantial portion of her memory if she underwent ECT. The staff at the hospital explained to the patient and family how significant changes in ECT, including the use of general anesthesia and muscle relaxants, have improved ECT. They explained that memory difficulties are usually short term and primarily affect the period just before and just after treatment. Ultimately, the patient and her family agreed that she should try ECT.

The woman's antidepressant medication was tapered off as she began a series of ECT treatments, administered three times a week. After three treatments, she had increased her

ability to participate in daily activities, dressing herself and interacting with her family. And after seven treatments, her worries about her sister began to subside.

As the course of ECT progressed, she continued to improve in her mood, energy level, appetite, and sleep. She was also much more interactive with her family and the staff. After 11 treatments, her improvement reached a plateau, and the course of ECT was ended. The patient was slowly restarted on nortriptyline and released from the hospital when the dose of the antidepressant reached therapeutic levels.

The woman was followed closely after her ECT treatment because the benefits of ECT are time-limited. One year after her hospitalization, her mood remains stable. She is continuing to take nortriptyline and has periodic blood tests to check that her dose remains therapeutic. She sees her psychiatrist regularly—every four to six weeks—to monitor symptoms and medications. And, she states that she is willing to undergo ECT again if her severe depression returns.



IN-DEPTH REPORT

Electroconvulsive Therapy Today

For patients with a seizure disorder, ECT is a little more tricky because anticonvulsants will block the effects of the treatment. The question is whether and by how much to lower the dose of the patient's anticonvulsants to allow the ECT to take effect. To determine this, we consult with the patient's neurologist. ECT actually has a net anticonvulsant effect and increases seizure threshold over time, so there are no detrimental long-term effects on the seizure disorder.

Q. What is the future of ECT/"seizure therapy"?

A. Neuroscientists and psychiatrists are hard at work looking for therapies that have the positive effects of ECT without the memory risks. The FDA is currently deciding, for example, whether to approve a technique known as rapid transcranial magnetic stimulation (rTMS), which involves the placement of an electromagnetic coil on the scalp. A pulsed high-intensity current is passed through the coil into specific areas of the brain, creating a powerful and focused magnetic field that changes the way brain cells function.

Another approach, magnetic seizure therapy, is a combination of ECT and rTMS: It uses a coil similar to the apparatus used in rTMS to stimulate only certain parts of the brain but induces seizures like ECT. It is still in the early stages of development but is designed to produce fewer side effects than ECT.