Clinical Policy Title: Electroconvulsive therapy (ECT)

Clinical Policy Number: 04.02.10

Effective Date: March 1, 2017
Initial Review Date: February 15, 2017
Most Recent Review Date: February 15, 2017
Next Review Date: February 2018

Policy contains:
• Electroconvulsive therapy (ECT)

Related policies:
CP# 00.02.13 Ketamine for treatment-resistant depression
CP# 09.03.01 Laser thermal ablation for epileptic seizures

ABOUT THIS POLICY: Prestige Health Choice has developed clinical policies to assist with making coverage determinations. Prestige Health Choice’s clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of “medically necessary,” and the specific facts of the particular situation are considered by Prestige Health Choice when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Prestige Health Choice’s clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Prestige Health Choice will update its clinical policies as necessary. Prestige Health Choice’s clinical policies are not guarantees of payment.

Coverage policy

Prestige Health Choice considers the use of electroconvulsive therapy (ECT) to be clinically proven and, therefore, medically necessary when the following criteria are met:

• Diagnosis:
  – Major depressive disorder (MDD)
  – Bipolar disorder
  – Schizophrenia
  – Schizo-affective disorder

• Symptoms:
  – Catatonia
  – Psychosis
  – Severe suicidality
  – Severe vegetative changes that may lead to significant deterioration of medical or psychiatric condition (sleep, oral intake, grave passive neglect, etc.)
Other considerations:
- Conditions where there is a need for rapid, definitive treatment response on either medical or psychiatric grounds
- Clinical circumstances where the risks of other treatments outweigh the risks of ECT (i.e., co-occurring medical conditions make ECT the safest treatment alternative)
- Psychiatric treatment failure (i.e., prior poor response to multiple medication regimens including antidepressants with adjunctive agents)
- Intolerable side effects to antidepressant medications (e.g., seizures, hyponatremia, severe anxiety)
- Psychiatric illness during pregnancy
- ECT is expressed as patient preference of therapy with history of positive response
- ECT is administered at a frequency sufficient to achieve therapeutic effect (e.g., 9-12 treatments in the acute phase)

Limitations:
Coverage determinations are subject to benefit limitations and exclusions as delineated by the state Medicaid authority. The Florida Medicaid website can be accessed at http://ahca.myflorida.com/Medicaid/.

Prestige Health Choice considers the maintenance use of ECT to be clinically proven and, therefore, medically necessary when the following criteria are met:
- Concomitant maintenance therapy consisting of psychotropic medications is prescribed
- Maintenance ECT is administered at the minimum frequency compatible with sustained remission
- The need for continued maintenance ECT is reassessed at least every three months.

Prestige Health Choice considers the use of Multiple-seizure ECT (MECT) to be clinically unproven and investigational, and therefore, not medically necessary.

All other uses of ECT are not medically necessary.

Alternative covered services:
Routine mental health and psychiatric services provided by an in-network provider

Background
ECT is an effective treatment for MDD, particularly depression that is resistant to pharma- and cognitive behavioral-therapies (Song 2015). Emerging data (Polyakova 2015) suggests that ECT may reduce depressive symptoms by increasing the expression of brain-derived neurotrophic factor (BDNF); however, conflicting findings have been reported and the presence of excess BDNF is not consistently associated with changes in behavior.
ECT has found use in treatment of schizophrenia, bipolar disorder, catatonia, epilepsy, obsessive-compulsive disorder (OCD) and various other mental health disorders worldwide (Lesage 2016, Zeiler 2016, Luchini 2015, Wang 2015, Leiknes 2012). One useful application of ECT is during and after pregnancy, when it may be undesirable to administer systemic neuroleptic agents that might find their way to the developing fetus or the breastfeeding newborn (Calaway 2016, Webb 2004).

Concerns persist that ECT may be associated with adverse cognitive side-effects, a limitation that potentially complicates its use in older patients. Attempts to segmentally limit ECT in order to spare critical brain areas have had mixed results (Tor 2015). There is also, unfortunately, a social stigma associated with ECT within the public and a negative bias toward ECT among some healthcare providers (Aoki 2016).

**Searches**

Prestige Health Choice searched PubMed and the databases of:
- UK National Health Services Centre for Reviews and Dissemination.
- Agency for Healthcare Research and Quality’s National Guideline Clearinghouse and other evidence-based practice centers.
- The Centers for Medicare & Medicaid Services (CMS).

We conducted searches on December 2, 2016. Search terms were: “electroconvulsive therapy”

We included:
- **Systematic reviews**, which pool results from multiple studies to achieve larger sample sizes and greater precision of effect estimation than in smaller primary studies. Systematic reviews use predetermined transparent methods to minimize bias, effectively treating the review as a scientific endeavor, and are thus rated highest in evidence-grading hierarchies.
- **Guidelines based on systematic reviews**.
- **Economic analyses**, such as cost-effectiveness, and benefit or utility studies (but not simple cost studies), reporting both costs and outcomes — sometimes referred to as efficiency studies — which also rank near the top of evidence hierarchies.

**Findings**

A comprehensive worldwide systematic review of ECT over the last 40 years (Lesage 2016) generated a crude rate of usage at 27/100,000 inhabitants in the United States (U.S.) a rate similar to that of Australia and approximately twice that of the United Kingdom. ECT utilization has diminished over time, probably due to the emergence of effective pharmaceuticals over the period of study, and is now indicated primarily in treatment-resistant situations. Its most common indication is clinical depression, with a ten-fold rate of usage than that of the second most-utilized diagnosis of schizophrenia. Lesage et. al. indicated that ECT is probably under-utilized in treatment of suicidality, and that as many as a fifth of suicides could have been positively impacted by its administration.
This review was preceded by a systematic review encompassing worldwide ECT since 1990 (Leiknes 2012). A clinical profile emerged during this period of treatment administered to older women with depression in Western countries and younger men with schizophrenia in Asian countries, with an average of eight treatments of bilateral application.

The Veterans Administration (VA 2016) and Department of Defense (DoD), and the Canadian Network for Mood and Anxiety Treatments (CANMAT 2016) have promulgated clinical practice guidelines for the management of MDD that include the use of ECT. These recommendations of ECT as a modality of therapy for selected indications and conditions are based on a moderate quality level of medical evidence and upon consensus judgment of practice patterns in North America.

The American Psychiatric Association (APA 2008) addresses the frequency, duration and number of treatments appropriate for use of ECT:

“ECT is most commonly performed at a schedule of three times per week. Some practitioners may use increased frequencies of ECT to speed the recovery, particularly in cases of severe symptom presentation; however, prolonged use of daily treatments is usually associated with increased cognitive impairments. There is no evidence that repeated courses of ECT lead to permanent structural damage, or that a maximum limit on lifetime number of treatments with ECT is appropriate. Continuation therapy, typically consisting of psychotropic medications or ECT, is indicated for virtually all patients. Maintenance ECT should be administered at the minimum frequency compatible with sustained remission, often at 1-3 week intervals. The need for continued maintenance ECT should be reassessed at least every three months.”

There are very few high quality randomized controlled clinical trials (RCTs) about the combination of antipsychotic medications and ECT in the treatment of refractory schizophrenia. A single systematic review and meta-analysis (Wang 2015) found that the combination of antipsychotic medications and ECT could improve psychiatric symptoms in patients with refractory schizophrenia; however there were problems with methodology (e.g., publication bias) and poor quality of evidence that cast a shadow on the validity of the work.

Although little is known about the long-term treatment outcomes following ECT for catatonia, its use is encouraged to avoid undue deterioration of the patient’s physical and mental condition (Luchini 2015).

The authors of UpToDate describe the indications and technical aspects, including frequency of treatment and duration, of treating the catatonic patient with ECT:

“ECT is generally safe, even in patients whose general medical status is compromised, as well as patients who are pregnant or elderly. However, the success of ECT depends upon an appropriate pre-ECT evaluation, the goals of which are to optimize treatment efficacy and minimize the risk of cognitive and other side
effects associated with ECT. ECT is typically administered with the same technique used for other indications. Catatonic patients with motor immobility and muscle damage are at increased risk for transient hyperkalemia associated with the muscle relaxant succinylcholine. Bitemporal electrode placement and brief pulse current are generally preferred. ECT is generally given three times per week on alternating days. However, for patients with malignant catatonia, we suggest daily treatments until the patient is physiologically stable, which often occurs within two to five treatments. At least six treatments are given regardless of the catatonia subtype to reduce the risk of sudden relapse. Most patients receiving ECT regardless of the indication remit with 6 to 12 treatments, but some patients may require 20 or more.”

ECT is usually terminated after the acute catatonic episode has remitted, but one case report from the University of Chicago (Pontikes 2010) described maintenance ECT for a patient with recurrent catatonia:

“Catatonia is a rare complication of multiple sclerosis (MS). We present a case of a 28-year-old inpatient with MS successfully treated with electroconvulsive therapy (ECT) after developing a catatonic syndrome. A subsequent relapse also responded to ECT, after which the patient received maintenance ECT for 13 months without complications. Follow-up 18 months later did not reveal any evidence of neurological deterioration. We conclude that ECT was a safe and effective treatment in this MS patient.”

The Center for Medicaid and Medicare Services has issued a National Coverage Determination with regard to multiple electroconvulsive therapy (MECT 2003):

“The clinical effectiveness of the multiple-seizure electroconvulsive therapy has not been verified by scientifically controlled studies. In addition, studies have demonstrated an increased risk of adverse effects with multiple seizures. Accordingly, MECT cannot be considered reasonable and necessary and is not covered by the Medicare program.”

A single systematic review (Fontanelle 2015) found 60 percent of OCD patients reported or exhibited some form of a positive response to ECT; however, it cannot be stated that the evidence is persuasive that ECT is indeed effective for OCD.

Electroconvulsion by ECT for refractory status epilepticus (Song 2015) cannot on the basis of available medical evidence be recommended at this time. Further prospective study of this therapy is required in order to determine its efficacy.

Finally, even though brief pulse (BP) ECT compared with ultra-brief pulse (UBP) unilateral ECT (Zeiler 2016) is an increasingly-used treatment option that can potentially combine efficacy with lesser cognitive side effects, current trials are sufficiently underpowered or have conflicting results that it cannot be routinely recommended.
### Summary of clinical evidence:

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<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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<tr>
<td><strong>Coffey (2016)</strong></td>
<td>Key points:</td>
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| Catatonia: Treatment and prognosis. | - ECT is generally safe  
- Success of ECT depends upon an appropriate pre-ECT evaluation, the goals of which are to optimize treatment efficacy and minimize the risk of cognitive and other side effects associated with ECT.  
- ECT is generally given three times per week on alternating days.  
- For patients with malignant catatonia, we suggest daily treatments until the patient is physiologically stable, which often occurs within two to five treatments.  
- At least six treatments are given regardless of the catatonia subtype to reduce the risk of sudden relapse.  
- Most patients receiving ECT regardless of the indication remit with 6 to 12 treatments, but some patients may require 20 or more." |
| **Lesage (2016)**      | Key points:                      |
| The Prevalence of Electroconvulsive Therapy Use Since 1973: A Meta-analysis. | - A systematic review of 18 studies across 12 countries over the last 40-plus years, inclusive of a total of 1,253,399,220 subjects produced a composite event rate of 16.9/100,000 inhabitants, characterized by high heterogeneity (Q = 18440.1; P < 0.0001).  
- In the United Kingdom, the prevalence was 13.0/100,000 inhabitants; in the U.S. it was 27.8/100,000 inhabitants; and in Australia, it was 27.2/100,000 inhabitants.  
- Compared to the most recent literature review by Leiknes et al, this is situated midway between the lowest and highest figures they found across 29 studies after 1990.  
- The more recent years of publication were a predictor of lower ECT rates, suggesting a decrease in ECT utilization across time.  
- The authors noted that ECT is rare as a specialist treatment for mental disorders probably because of its indication for treatment-resistant mental disorders.  
- From a diagnostic point of view or following ECT treatment guidelines, an annual event rate of 17 per 100,000 inhabitants can be compared with an estimated annual prevalence of 5% for depression (or 5000 per 100,000 inhabitants); approximately 0.4% for schizophrenia (or 400 per 100,000 inhabitants); and a hospitalization rate estimated at about 600 per 100,000 inhabitants.  
- Electroconvulsive therapy remains very rare for people with depression and schizophrenia.  
- An audit of a 5-year history of suicides in different hospitals and 1 Canadian province representing just 5% of all suicides at the end of the 1980s indicated that 17% of the hospitals' suicides could have benefited from ECT, but it was not administered.  
- There was a rate-limiting influence rooted in resources across the countries: i.e., adequate psychiatrist manpower in operating rooms with adequate anesthesia procedures and ECTapparatuses. |
<p>| <strong>Leiknes (2012)</strong>     | Key points:                      |</p>
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| Contemporary use and practice of electroconvulsive therapy worldwide. | • A systematic review explored contemporary (from 1990) utilization and practice of ECT.  
• Seventy studies were included, seven from Australia and New Zealand, three Africa, 12 North and Latin America, 33 Europe, and 15 Asia.  
• Worldwide ECT differences and trends were evident  
• The majority of EC-treated persons were older women with depression in Western countries, and younger men with schizophrenia in Asian countries.  
• Average number ECTs administered per patient were eight  
• The preferred electrode placement was bilateral  
• Persistent aberrations of inadequate training and failure to follow guidelines were troubling. |
| Management of Major Depressive Disorder Working Group. (2016) VA/DoD clinical practice guideline for the management of major depressive disorder. | Key points:  
• The VA/DoD clinical practice guidelines for the management of MDD recommend offering ECT with or without psychotherapy in patients with severe MDD and any of the following conditions:  
  - Catatonia  
  - Psychotic depression  
  - Severe suicidality  
  - A history of a good response to ECT  
  - Need for rapid, definitive treatment response on either medical or psychiatric grounds  
  - Risks of other treatments outweigh the risks of ECT (i.e., co-occurring medical conditions make ECT the safest treatment alternative)  
  - A history of a poor response to multiple antidepressants  
  - Intolerable side effects to all classes of antidepressant medications (e.g., seizures, hyponatremia, severe anxiety)  
  - Patient preference  
  - Pregnancy |
| CANMAT (2016) Clinical Guidelines for the Management of Adults with Major Depressive Disorder: Section 4. Neurostimulation Treatments. | Key points:  
• The CANMAT guidelines on the management of MDD found evidence for efficacy, tolerability, and safety of ECT as a second-line treatment for patients with treatment-resistant depression, although in some situations it may be considered first line. |
| Song (2015) Treatment of Adults With Treatment-Resistant Depression: Electroconvulsive Therapy Plus Antidepressant or Electroconvulsive Therapy Alone? Evidence From an Indirect Comparison Meta- | Key points:  
• A systematic review (n=1098) looked at therapeutic response in ECTplus antidepressant versus ECT alone and antidepressant alone  
• Evidence suggested that response rate can be improved in the ECT plus antidepressant (RR, 1.82; 95% CI, 1.55-2.14) and ECT alone group (RR, 2.24, 95% CI, 1.51-3.33) compared with antidepressant alone.  
• ECT plus antidepressant increased the incidence of memory deterioration relative to ECT alone. |
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<td>Analysis.</td>
<td>• Adverse complications (e.g., memory deterioration and somatization) were noted in the 4th week after treatment (RR, 0.09, 95% CI, 0.02-0.49).</td>
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| Polyakova (2015) Brain-Derived Neurotrophic Factor and Antidepressive Effect of Electroconvulsive Therapy: Systematic Review and Meta-Analyses of the Preclinical and Clinical Literature. | **Key points:**  
• A systematic review and meta-analysis examined the association between ECT treatment and changes in BDNF concentrations and their effect on behavior.  
• Plasma but not serum BDNF increased following ECT (g = 0.72 vs. g = 0.14; 23 effect sizes, n = 281).  
• There were no indications that an increase in BDNF expression was associated with behavioral changes in humans.  
• The authors concluded that ECT in humans increases BDNF concentrations but this is not consistently associated with changes in behavior. |
| Wang (2015) Efficacy and safety of treating patients with refractory schizophrenia with antipsychotic medication and adjunctive electroconvulsive therapy: a systematic review and meta-analysis | **Key points:**  
• A systematic review and meta-analysis (n=1394) assessed the efficacy and safety of the combined treatment of refractory schizophrenia with antipsychotic medications and ECT.  
• Combined treatment with antipsychotic medications and ECT had significantly higher rates of achieving clinical improvement (RR=1.25, 95%CI=1.14-1.37).  
• The proportion of participants who experienced headache during the treatment was significantly higher in the combined treatment group (RR=9.10, 95%CI=3.97-20.86, based on a pooled sample of 517 from 8 studies) and the proportion who experienced memory impairment was also higher in the combined treatment group (RR=6.48, 95%CI=3.54-11.87). |
| Calaway (2016) A Systematic Review of the Safety of Electroconvulsive Therapy Use During the First Trimester of Pregnancy. | **Key points:**  
• A systematic review of ECT during gestation suggested that ECT is relatively safe when administered during the first trimester of pregnancy.  
• Adverse outcomes, including miscarriage, vaginal bleeding, self-limited abdominal pain, and self-limited fetal spasms, were observed. |
| Webb (2004) Postpartum electroconvulsive therapy: a systematic review and case report. | **Key points:**  
• A systematic review of ECT during the postpartum period reported that ECT is effective in the postpartum period.  
• The authors noted ECT was well tolerated, provided a fast response and did not interrupt breastfeeding. |
| Fontanelle (2015) Electroconvulsive therapy for obsessive-compulsive disorder: a systematic review. | **Key points:**  
• A systematic review (n=279) compared the characteristics of OCD responders to ECT versus nonresponders.  
• A positive response was reported in 60.4% of the 265 cases in which individual responses to ECT were available.  
• ECT responders exhibited a significantly later onset of OCD symptoms (P = .003). |
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| Key points:       | • A systematic review identified 14 original articles with a total of 19 patients receiving ECT for refractory status epilepticus.  
                    • Of the 19 patients, 15 were adult, and 4 were pediatric.                                                                                                      
                    • All studies were retrospective in nature.                                                                                                                      
                    • Seizure reduction/control with the application of ECT occurred in 11 of the 19 patients (57.9%), with 4 (21.0%) and 7 (36.8%) displaying partial and complete responses respectively. 
                    • Seizures control lasted for variable duration, with the most commonly quoted duration ranging from 2 weeks to 3 months.  
                    • Data on patient functional outcome was available in 13 patients, with 10 patients falling into the categories of dead or severely disabled. |
| Key points:       | • A narrative review suggested that ECT is effective in all forms of catatonia, even after pharmacotherapy with benzodiazepines has failed.                                   
                    • The authors cited response rates of catatonia to ECT from 80% to 100% in evidence to support their assertion.                                 
                    • In summary the authors opined that ECT should be considered first-line treatment in patients with malignant catatonia, neuroleptic malignant syndrome, delirious mania  
                      or severe catatonic excitement, and in general in all catatonic patients that are refractory or partially responsive to benzodiazepines.  
                    • They also advocated for early treatment with ECT prior to patient deterioration that might adversely affect its efficacy. |
| Key points:       | • A systematic review examined the potential for avoiding cognitive side effects from ECT.                                                                               
                    • BP unilateral ECT was significantly more efficacious in treating depression than UBP unilateral ECT (standardized mean difference = 0.25; 95% CI, 0.08–0.41; P =.004) but showed significantly more cognitive side effects in all cognitive domains examined (global cognition, anterograde learning and recall, retrograde memory) (P < .01).  
                    • The mean number of treatment sessions given was 8.7 for BP ECT and 9.6 for UBP ECT (P < .001).                                                            
                    • UBP had a lower remission rate (OR = 0.71; 95% CI, 0.51–0.99; P = .045), with a number needed to treat of 12.1.                                               |
| Key points:       | • A meta-analysis of ECT noted that despite its efficacy and safety, ECT is underutilized, in part due to stigma associated with the treatment.                              
                    • Experience with ECT may have a positive impact on knowledge of and attitudes toward ECT.                                                                       |
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| Pontikes (2010) | **Key points:**  
- Case report of a 28-year-old inpatient with MS successfully treated with ECT after developing a catatonic syndrome.  
- A subsequent relapse also responded to ECT, after which the patient received maintenance ECT for 13 months without complications.  
- Follow-up 18 months later did not reveal any evidence of neurological deterioration. |
| APA (2008) | **Key points:**  
- ECT is most commonly performed at a schedule of three times per week.  
- Some practitioners may use increased frequencies of ECT to speed the recovery, particularly in cases of severe symptom presentation.  
- Prolonged use of daily treatments is usually associated with increased cognitive impairments.  
- There is no evidence that repeated courses of ECT lead to permanent structural damage, or that a maximum limit on lifetime number of treatments with ECT is appropriate.  
- Maintenance ECT should be administered at the minimum frequency compatible with sustained remission, often at 1-3 week intervals.  
- The need for continued maintenance ECT should be reassessed at least every three months. |

**References**

**Professional society guidelines/other:**


**Peer-reviewed references:**


**CMS National Coverage Determinations (NCDs):**

160.25 National Coverage Determination: Multiple Electroconvulsive Therapy (MECT). CMS Medicare Coverage Database Web site. [https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=278&ncdver=1&CoverageSelection=Both&ArticleType=All&PolicyType=Final&s=All&KeyWord=Electroconvulsive+therapy&KeyWordLookUp=Title&KeyWordSearchType=And&list_type=ncd&bc=gAAAACAAAAAAA%3d%3d&](https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?NCDId=278&ncdver=1&CoverageSelection=Both&ArticleType=All&PolicyType=Final&s=All&KeyWord=Electroconvulsive+therapy&KeyWordLookUp=Title&KeyWordSearchType=And&list_type=ncd&bc=gAAAAACAAAAAAA%3d%3d& Accessed February 8, 2017.

**Local Coverage Determinations (LCDs):**

No LCDs identified as of the writing of this policy.

**Commonly submitted codes**

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
<th>Comments</th>
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<td>90870</td>
<td>Electroconvulsive therapy (includes necessary monitoring)</td>
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<thead>
<tr>
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<tr>
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<td>Major depressive disorder</td>
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