

Provincial Clinical Knowledge Topic Electroconvulsive Therapy, Adult – Inpatient, Ambulatory V 1.0

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Document History

Version	Date	Description of Revision	Completed By / Revised By
1.0	Sept. 2017	Final document completed	Dr. Michael Demas

Important Information Before you Begin

The recommendations contained in this knowledge topic have been provincially adjudicated and are based on best practice and available evidence. Clinicians applying these recommendations should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care. This knowledge topic will be reviewed periodically and updated as best practice evidence and practice change.

The information in this topic strives to adhere to Institute for Safe Medication Practices (ISMP) safety standards and align with Quality and Safety initiatives and accreditation requirements such as the Required Organizational Practices. Some examples of these initiatives or groups are: Health Quality Council Alberta (HQCA), Choosing Wisely campaign, Safer Healthcare Now campaign etc.

This topic is based on the following guideline(s):

1. Canadian Psychiatric Association Guidelines for Electroconvulsive Therapy
2. Electroconvulsive Therapy Guidelines for Alberta Health Services – Calgary Zone
3. Electroconvulsive Therapy Guidelines for Alberta Health Services – Edmonton Zone
4. Canadian Network for Mood and Anxiety Disorders (CANMAT): Clinical Guidelines for the management of adults with Major Depressive Disorders Section 4: Neurostimulation Treatments. 2016
5. Electroconvulsive Therapy Guidelines for Health Authorities in British Columbia
6. NICE Guideline: Guidance on the use of Electroconvulsive Therapy (TA59)
7. American Psychiatric Association Guidelines for Electroconvulsive Therapy

Rationale

In many studies conducted in the general population depression is a common mental condition with an annual prevalence rate from 5% to 12%. Not all patients respond to the available pharmaceuticals and treatment algorithms. Approximately 20% of persons will have Treatment Resistant Depression. Depression is the leading cause of disability world-wide and is a major contributor to the overall global burden of disease.³

Severe mental disorders are associated with considerable personal suffering, occupational and social disadvantage and impairment in interpersonal and family relationships. They have high economic impact, with the indirect costs far exceeding the direct costs.³

Electroconvulsive Therapy (ECT) has been an approved treatment for patients with major depressive episodes, other depressive disorders, postpartum depression, Bipolar disorder, Catatonia, Schizophrenia and other conditions. "During electrostimulatory therapy, a very tiny current is passed through the brain. The charge delivered is very small and is commonly only about one tenth to one fifth of a coulomb. This current stimulates nerve cells across a wide range of brain territories and causes them to repeatedly signal in a synchronized fashion for about ½ to 1 minute. The stimulated nerve cells release chemicals which, in turn, elicit other changes in brain functioning. Antidepressant and other benefits are believed to result from some of these effects. The delivered current also stimulates the brain cells which control movement, resulting in brief contractions of the muscles of the body. As the muscular contractions are unnecessary for the therapeutic action of ECT, a muscle relaxant is administered before ECT. The entire treatment is conducted under brief general anesthesia so that there is no awareness of discomfort during the procedure'. The procedure is painless.⁴

The decision as to whether ECT is clinically indicated should be based on a documented assessment of the risks and potential benefits to the individual including the risks associated with the anaesthetic, current co-morbidities, potential adverse events, and the risk of not having treatment. Relapse rates after an acute course of ECT can be high without continuation or maintenance pharmacotherapy and/or ECT.⁵

Goals of Management

1. A trained credentialed psychiatrist must determine the need for Electroconvulsive Therapy (ECT) and prescribe the treatment.
2. In determining the indications for ECT the treating physician should take into consideration the likelihood for positive outcome with ECT versus other treatments and the severity of risk associated with the mental disorder being treated.
3. ECT is prescribed following a thorough psychiatric evaluation and assessment of any co-morbidities such as substance use, personality disorder and anxiety disorders.
4. The decision to prescribe ECT should be in keeping with current evidence informed or other clinical practice guidance and be made jointly by the individual or their decision maker and the clinician responsible for the treatment
5. Informed consent is obtained from the competent patient, or their legal decision maker, by the psychiatrist. AHS Consent to Treatment and Procedures is followed. Consent can be withdrawn at any time during the treatment.
6. The diagnostic indication(s) are clearly stated on the medical record of the patient.
7. Appropriate follow up is arranged for further treatment with an appropriate care provider.

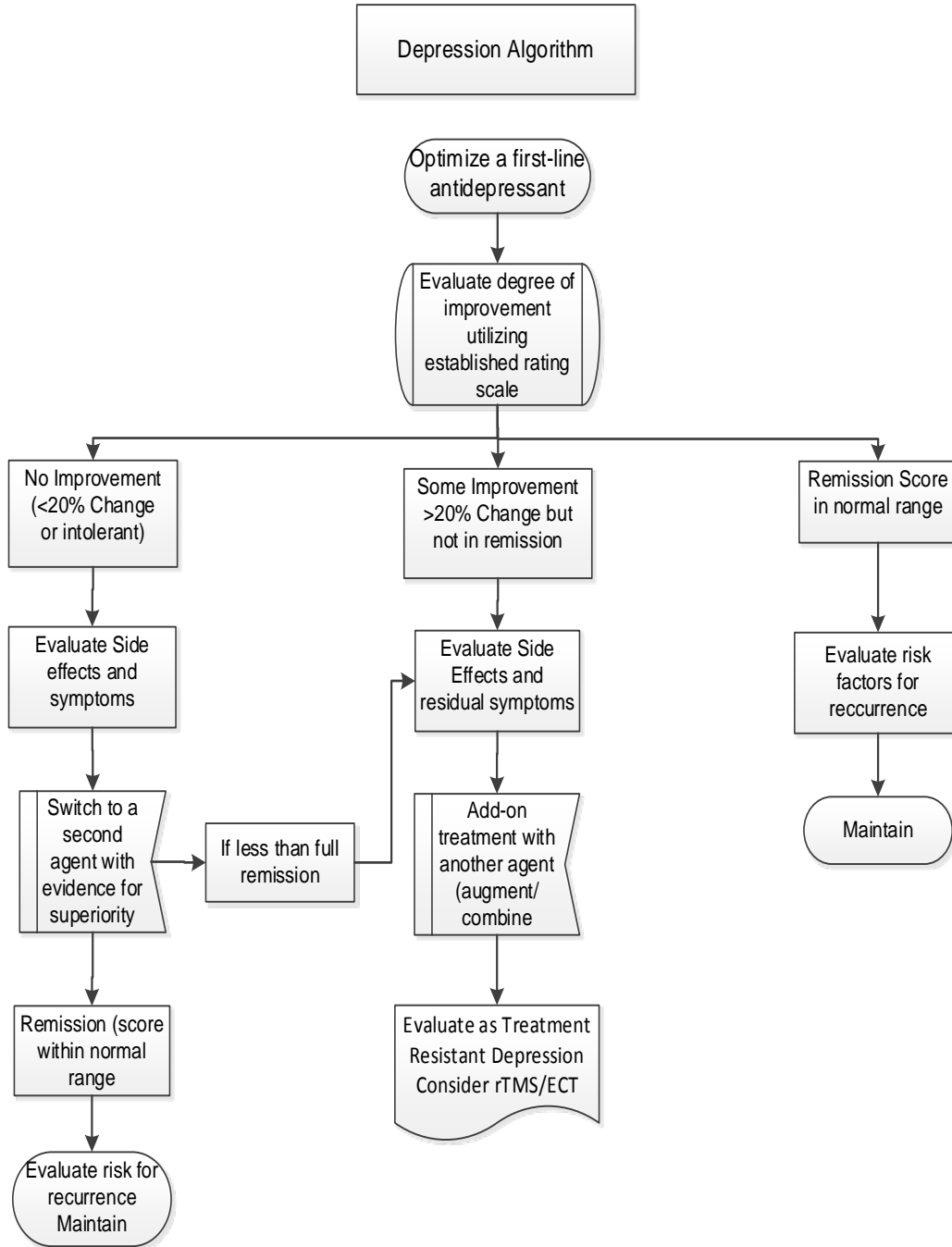
Decision Making

Principles of Care

Prior to exploring electroconvulsive therapy (ECT) consideration should be given the likelihood for positive outcome with ECT versus other treatments, and the severity and risk associated with the mental disorder being treated. Prior to recommending ECT some suggested principles of care to consider are²:

- Assess a person referred to a mental health specialist including:
 - symptom profile, suicide risk, treatment history and comorbidities
 - psychosocial stressors, personality factors and significant relationship difficulties, particularly if the depression is chronic or recurrent
 - substance use such as alcohol, tobacco and street drugs
- Consider reintroducing treatments that have been inadequately delivered or inadequately adhered to by the patient or alternative treatments
- Previous treatment regimen documented
- Use a multidisciplinary approach to manage crises for patients with severe depression who present significant risk, and to deliver high-quality acute care.
- Monitor risk in a way that allows patients to continue their lives with minimum disruption and follow up required
- Develop a multidisciplinary care plan with the person (and their family or care giver if the person agrees) which:
 - identifies the roles of all professionals involved
 - includes a crisis plan that identifies potential crisis triggers and strategies to manage them
 - is shared with the person, their Primary Care Physician and other relevant people

Figure 1 Clinical Depression Algorithm ¹



Adapted from CANMAT Journal of Affective Disorders

Electroconvulsive Therapy Administration

Inclusion Criteria

- Depressive Episode including depression with psychotic features, treatment resistant depressive disorder, and other depressive episodes
- Acute suicidal risk
- Rapidly deteriorating physical status due to complications from a neuropsychiatric condition
- Catatonia
- A prolonged or severe manic episode
- Unstable Bipolar Affective Disorder
- Treatment Resistant Schizophrenia or Schizophrenia Spectrum Disorder
- Patients with a poor response or intolerance to medications and their side effects
- Patients who prefer ECT over taking medications
- For patients who have responded to ECT previously and are experiencing a recurrence of their illness
- During pregnancy when medications can't be used due to harm to the developing fetus. Fetal monitoring should occur before and after each ECT treatment
- Agitation and aggression in patients with severe dementia

Exclusion Criteria

There are no absolute exclusion criteria for Electroconvulsive therapy

Precautionary Considerations

- Unstable of severe cardiovascular conditions, such as recent myocardial infarction, unstable angina, poorly-compensated heart failure, and severe valvular cardiac disease including critical aortic stenosis
- Aneurysm or other cerebrovascular malformation that might be susceptible to rupture with increased blood pressure
- Increased intracranial pressure, as may occur with some brain tumors or other space-occupying cerebral lesions
- General risks associated with general anaesthesia
- Patient status rated as ASA (American Society of Anaesthesiologists³) level 4 or 5.
- Other conditions such as osteogenesis imperfecta, unstable fractures, history of malignant hyperthermia
- Pheochromocytoma

Adverse Events

- Headache
- Myalgia's (generalized body muscle pain)
- Memory impairments – both anterograde and retrograde. (Note: there is a purposeful amnesia for the procedure)
- Switching to manic, hypomanic, mixed states or rapid cycling
- Delirium, confusion, cognitive impairment
- Dental injury
- Status epilepticus or prolonged seizures

Electroconvulsive Therapy Procedure

Electroconvulsive therapy (ECT) is a procedure that entails induction of a seizure by applying an electrical stimulus to the brain. It is an effective and well established treatment method for depression and other mental disorders. ECT can be provided in a variety of clinical settings, such as an ambulatory or a pre-operative area. ECT should be carried out close to the necessary resources in case of a medical emergency. When providing ECT adequate personnel are required which may include: Psychiatrist, Anaesthetist, RN or Psychiatric RN with post anesthesia background or competency in airway management and Respiratory Therapist.

ECT is usually provided 2-3 times per week during an index course and generally administered on non-consecutive days. Usually there are no more than 3 treatments per week and no more than one treatment session per day but newer forms of ECT may allow more treatments per week. Urgent situations may require daily ECT. The total number of sessions depends upon the type of ECT administered and based upon risks/adverse events, and response to the treatment with the goal being full remission of symptoms. For some types of ECT the number of treatments is typically 6-12 based on the response from the sessions. For other types of ECT such as Ultra Brief Pulse Width ECT the number is greater. It is recommended that if a patient does not show significant response after 10 treatments of an index course that there should be consideration of a change to another type of ECT (e.g. from Unilateral to Bilateral ECT). ECT is carried out under general anaesthesia. An anaesthetic consultation before the index course of ECT administration is required. The risks of anaesthesia are discussed with the patient by the anaesthetist. An adequate neuromuscular blockade is ensured prior to the stimulus delivery. Unmodified ECT should not be used.

Clinical assessment should be performed and documented by the attending physician before the course of ECT, and on an ongoing basis during the course of ECT.

Pre-Assessment

An adequate pre-ECT work-up should include the following for patients embarking on an index course of ECT:

- A clinically relevant physical examination
- Evaluation of dentition for the presence of dentures and dental problems. Temporal-mandibular joint problems may also be noted.
- An initial electrocardiogram is recommended particularly for those with known cardiovascular disease, for those with cardiovascular risk factors, and generally for persons age 50 and older
- An anaesthesia consultation particularly for those with significant cardiovascular or neurological conditions, and for those who are pregnant
- Appropriate consultations for co-morbid medical conditions particularly for unstable conditions such as diabetes, asthma
- Routine lab investigations guided by the patient's history and physical examination usually include a complete blood count, serum electrolytes and renal function tests
- Other investigations as clinically indicated such as Chest X-ray, cervical spine x-ray

A careful review of medication, any over the counter products, herbals and vitamins that the person is taking is essential before starting a course of ECT. Existing medications for medical illness can usually be continued throughout the ECT course. Consideration should be given to reviewing medications to decrease the risk of delirium and reduce the medication effect on seizure threshold. Medications that can affect seizure threshold are often held prior to ECT. Diabetic patients should be given priority if several patients receive ECT on the same day. Insulin and hypoglycemic agents are usually given after the treatment.

An evidence informed approach to the method of assessing the tolerability and efficacy of ECT therapy and continuous quality improvement should be utilized. Patient and clinician driven tools that provide a common comparable outcome to other medical treatments, that are validated, reliable, generally comparable to the medical literature, that are already in use, and produce a useful summary metric should be utilized. The patient's symptoms should be documented before a course of treatment in order to be able to assess progress in specific target symptoms during treatment.

The use of rating scales such as the Hamilton Depression Rating Scale (HAM-D) Beck Depression Inventory (BDI), Quick Inventory of Depressive Symptomatology (QIDS-SR16), or Patient Health Questionnaire (PHQ-9) can assist the clinician in determining response to the treatment and improvement to quality of life.

The following are clinical assessment tools that are recommended to assist with safety, outcome measurements and improvement in quality of life:

1. **Pre-ECT Checklist:**

- **Required** – A formalized safety screen must be done prior to ECT

2. **Clinician Rated:**

- Hamilton Rating Scale for Depression⁹ (HAM-D)

3. **Patient Rated:**

- The Beck Depression Inventory¹⁰ (BDI – II [21 item])
- Quick Inventory of Depressive Symptomatology¹¹ (QIDS-SR16) or
- Patient Health Questionnaire¹² (PHQ-9)

4. **Functional, Quality of Life and Health Outcomes:** Note both are required

- EuroQol Five Dimensions Questionnaire¹³ (EQ-5D)
- World Health Organization Disability Assessment Schedule¹⁴ (WHODAS 2.0)

5. **Suicide Assessment:**

- The Columbia Suicide Severity Rating Scale Lifetime/Recent¹⁵ (CSSR)

A suicide risk assessment should be completed prior to initiation of therapy and at least once during the index or maintenance course of treatment.

7. **Cognitive Assessment**

Clinicians might consider the following and/or more formalized psychometric testing if the situation is clinically warranted:

- Montreal Cognitive Assessment¹⁶ (MoCA)
- Folstein Mini-Mental Status Examination¹⁷ (MMSE)

8. **Post ECT Checklist**

- **Required** – A formalized safety screen must be done following ECT treatment

The American College of Neuropharmacology¹⁸ (ACNP) definitions for response, relapse, remission, and recovery for Major Depressive Disorders will be utilized to define the effectiveness/efficacy of treatment:

- Response – measured 1 month later – a 50% reduction in pre-treatment severity the patient is considered a responder. Less than 50% response then the patient is classified as a non-responder
- Remission – ascribed after 3 consecutive weeks during which minimal symptom status (absence of both sadness and reduced interest/pleasure along with the presence of fewer than three of the remaining seven DSM-IV TR/DSM 5 diagnostic criterion symptoms (typically indicated by scores on the rating scale(s) within the non-depressed range) is maintained
- Recovery – is ascribed after 4 months following the onset of remission without the occurrence of relapse
- Relapse – a return of the index major depressive episode following the onset of remission

ECT Administration

- Specifics of the course of ECT are reviewed prior to each treatment including
 - Index or maintenance course
 - Type of ECT & Stimulus Electrode Placement (d'Elia, Bi-temporal, Bi-frontal, other)
 - Stimulus parameters (pulse width, frequency, duration, current)
 - ECT frequency
 - Seizure duration
 - Evidence of side-effects including any cognitive changes
 - Evidence of clinical response
- Stimulus electrodes are prepared with the full coverage of conducting gel, if metal, or pre-gelled disposable electrodes are used.
- The electrodes are correctly positioned according to the chosen anatomical landmarks ([see Figure 2](#))
 - Unilateral placement (UL) – the d'Elia position is the recommended unilateral placement site over the non-dominant hemisphere (generally right side – RUL) Bilateral placement – usually Bi-temporal (BT)
 - Other placement positions might be considered such as Bi-frontal (BF) or Left Anterior Right Temporal (LART) placement
- As mandatory protection, a bite block is inserted for all patients
- Continuous pulse oximetry, ECG, and EEG monitoring as well occurs throughout the procedure as well as vital sign monitoring. EEG monitoring is typically via a two-channel frontal mastoid placement
- Adequate neuromuscular blockade is ensured prior to the stimulus delivery.
- Following the delivery of the stimulus the resulting seizure is observed and documented. In a typical ECT-induced seizure the amplitude increases, the frequency decreases (slows) where seizure recruitment & propagation is fast while seizure termination is often slow. Bi-hemispheric EEG wave synchronicity, amplitude changes during the seizure, bilateral post ictal suppression, to some extent seizure duration, and heart rate changes during the treatment are associated with a beneficial clinical response¹⁸
- Recommendations for maintenance ECT treatments are recorded and communicated

Figure 2 ECT Electrode Placement Examples

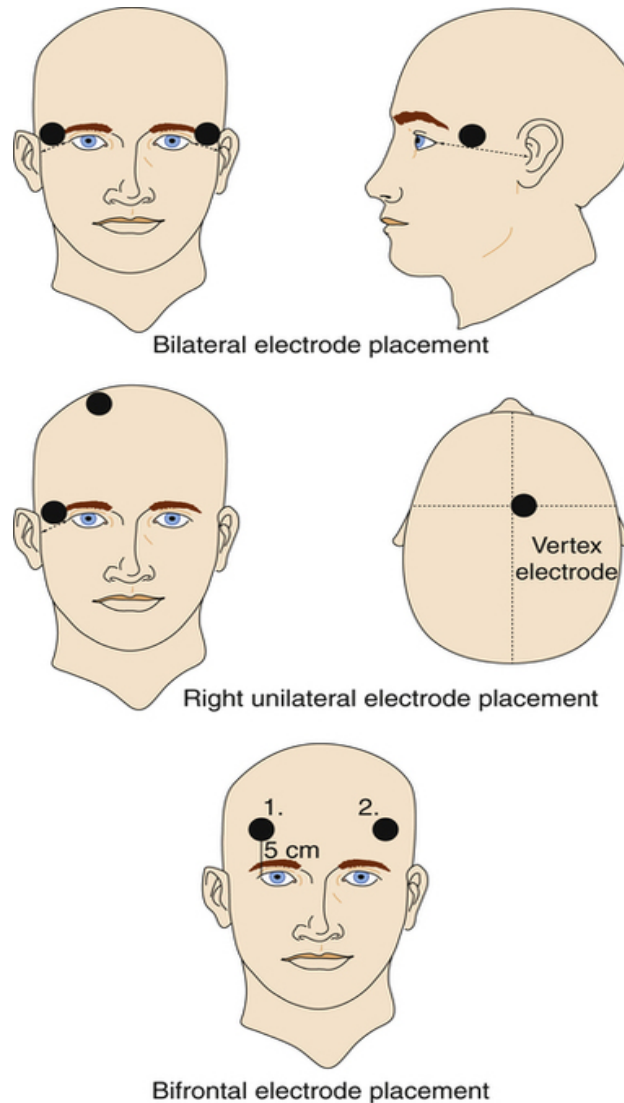


Table 1 Recommendation for Delivery of ECT ¹

Site	Seizure Threshold
<i>Right or Left Unilateral</i>	<ul style="list-style-type: none"> Brief Pulse* – 5-6 times seizure threshold Ultra-Brief Pulse* – 5 - 7 times seizure threshold
<i>Bi-frontal</i>	<ul style="list-style-type: none"> Brief Pulse – 1.5-2.times seizure threshold Ultra-Brief Pulse – 1.5-2 times seizure threshold
<i>Bi-temporal</i>	<ul style="list-style-type: none"> Brief Pulse – 1.5-3 times seizure threshold

*Brief Pulse Width = 0.5 milliseconds

*Ultra Brief Pulse Width < or = to 0.37 milliseconds (usually 0.3, or 0.25 depending upon manufacturer and machine)

Post Procedure Management

- Patients are monitored in the post anaesthetic recovery room by recovery room staff for an appropriate length of time as determined by the anaesthetist
- Monitoring and documentation of any adverse events
- Assessment of response to treatment using standard clinical assessment tools is recommended ([See Pre-Assessment](#))
- A follow-up clinical treatment plan is documented and pharmacology is reviewed with the patient on an ongoing basis
- Medication regimen and compliance are closely monitored on an ongoing basis
- Communication is provided to the primary care physician re response to treatment and follow up treatment plan on an ongoing basis
- A plan is in place for relapse prevention and communicated to the primary care physician

Continuation and Maintenance ECT

Index Treatment

An index course of treatment is defined as the initial series of treatment given to relieve acute symptoms of the illness. The total number of sessions provided in an index course of treatment is based upon the type of ECT administered and the risk/adverse events and response to the treatment. Brief Pulse Width usually is 6 -12 treatments, Ultra Brief Pulse Width usually requires more treatments. Treatment should be guided by each individual's clinical condition and the history of relapse when attempts have been made in the past to taper continuation treatment. There is no defined specific number of treatments.

As clinically indicated consideration can be given to optimize ECT technique by:

- Increasing/changing the stimulus parameters
- Minimizing or removing medication that may decrease response (e.g. benzodiazepines, anticonvulsants)
- Optimizing anaesthetic agents such as dose sparing of propofol with remifentanyl.
- Changing to a different stimulus electrode placement after an adequate trial of the current type of ECT

Continuation/Maintenance Treatment

A continuation course of treatment is defined as a course of treatment that is an extension of, and begins after the index course, that is designated to prevent a relapse of the episode, and/or further response to remission, generally during the 6 months following the index course of treatment.

A maintenance course of treatment is defined as a course of treatment that begins after the end of the continuation or index course of treatment, and is intended to prevent recurrence of a new episode, traditionally beyond the 6 month period.

- Continuation/Maintenance treatment may consist of medication treatment, psychotherapy, and other treatments in combination with continuation of ECT at a reduced treatment frequency
- On-going discussion with the patient/family re consent to treatment

Anaesthesia Guidelines

Pre-Anaesthetic Period

- An anaesthetic consultation should be completed before the index course of treatment and when there is a significant change in the patient's medical status or medications
- A written report provided and documented on the patient record
- Preoperative modification of antidepressant medications discussed with the attending psychiatrist
- Preoperative orders for the patient provided before each treatment
- Routine Lab investigations should be guided by the presence and severity of medical risk factors and co-morbidities e.g. CBC & Diff, electrolytes, urinalysis, creatinine, and EKG ordered if clinically indicated
- Oral intake as per the current Canadian Anaesthesiologists' Society Guidelines²⁰. Minimum duration of fasting should be at least eight hours before treatment
- Proper pre and peri-operative management of the patient in accordance with good medical care
- All diabetics should have a baseline glucometer reading performed and appropriate intervention based on glucometer reading
- Any pre-treatment medications must be prescribed by the primary treating psychiatrist and/or anaesthesiologist and should be taken on treatment days with a sip only, of water only, typically immediately upon arising.

ECT Administration

- Current ECT practice requires a general anaesthetic, pre-oxygenation with 100% Oxygen, hyperventilation with 100% Oxygen just prior to the stimulus, continuous pulse oximetry, EKG, and EEG monitoring.
- Equipment assessed prior to initiating ECT
- Ensure monitors are attached and baseline measurement of parameters obtained
- Administer anaesthetic drugs ensuring adequate pre-oxygenation, air way control, and placement of bite-block to protect the teeth and oral structures during the seizure
- Selection of drugs and doses individualized to the patient
- Monitor the patient for the appropriate level of sedation throughout the procedure
- Seizures persisting for more than 180 seconds should be considered prolonged, and should be treated pharmacologically
- Transfer the patient to the recovery room when clinically indicated
- Once the patient is safe to protect their own airway and is sufficiently alert they can be transferred from the Recovery Room to the post-anaesthetic care area
- The course of the anaesthetic is documented on the patient record

Procedural Medications

The following are a list of medications that anaesthesia may utilize for the ECT procedure:

- Induction Agents
 - propofol
 - ketamine
- Reversal Agents
 - flumazenil (a reversal agent for benzodiazepines only)
 - naloxone (reversal agent for opioids)

- Paralytics are used to minimize risk of skeletal injury during seizure. Complete paralysis is not necessary.
 - succinylcholine
 - rocuronium
- Anticholinergic Agents – should be administered intravenously in sufficient time before the stimulus (1-3) minutes to attenuate the vagal effects on the heart
 - glycopyrrolate
 - atropine
- Narcotic/Analgesic Agents
 - remifentanil
 - morphine
 - codeine
 - oxyCODONE
 - ketorolac
 - ibuprofen
 - acetaminophen
 - acetylsalicylic acid
- Triptans
 - almotriptan
 - frovatriptan
 - rizatriptan
 - sumatriptan*
 - zolmitriptan
- Antinauseants
 - dimenhydrinate
 - ondansetron
 - metoclopramide

**sumatriptan is currently the only triptan available via the AHS formulary however patients may bring their own supply.*

Post-Anaesthetic Period

- Communicate any medical or anaesthetic concerns to the post-anaesthetic care area (PACU) nurse
- Ensure the patients airway, breathing, and circulation continues to remain stable and administer supplemental oxygenation if required
- Remain in the recovery area to receive the initial set of vital signs from the PACU nurse
- Document and sign anaesthetic drugs and dosages on the Post-anaesthetic record
- Diagnose and treat abnormalities in vital signs and other complications
- Document any adverse events and communicate them to the attending Psychiatrist and Anaesthesiologist
- It is the responsibility of the anaesthetist in conjunction with the PACU staff to determine when the patient is ready for discharge from the unit²¹

Management of Adverse Events

Cardiovascular and/or Respiratory Arrest

- Manage as per current ACLS protocols

Postictal Delirium

- This associated with marked agitation, disorientation, poor response to commands and a sympathetic response. Bilateral electrode placement, high-intensity stimulation and pre-existing cerebral impairment may increase this risk.
- This can be managed supportively with reassurance, or pharmacologically, with intravenous benzodiazepines such as midazolam, LORazepam or intravenous haloperidol and other medications
- If postictal delirium is recurrent or severe it can be managed prophylactically with the use of the above after seizure termination or after onset of spontaneous respirations.

Emergent Hypomania/Mania

A hypomanic or manic switch can occur during a course of ECT. The switch to mania or hypomania has been found most often in bipolar patients or patients with a family history of bipolar disorder.

Strategies for managing hypomania/mania can range from:

- Stopping ECT and treating the manic symptoms with a mood stabilizer and/or antipsychotic
- Suspending further treatments and observing the patient
- Continuing ECT treatment to treat both the manic and depressive symptoms with or without medication changes

Prolonged Seizure/Status Epilepticus

- This is associated with a seizure which occurs lasting longer than 180 seconds
- Status epilepticus is defined where a seizure lasts more than 5 minutes or two or more seizures occur within a 5 minute period
- Both are treated with benzodiazepine medication, oxygen, airway support, ongoing monitoring and follow “standard treatment protocols”
- Intubation may be required to maintain adequate oxygenation
- The placement of the electrodes is reviewed prior to considering continuing with ECT treatment if either of the above has occurred

Clinical Documentation

Pre Procedure

Physician Assessment and Documentation

- Mental status examination completed and documented including level of consciousness, orientation and presence of confusion and any general concerns or complaints.
- Physical examination with a review of any co-morbidities such as substance use, anxiety disorder, significant cardiovascular, cerebrovascular, pulmonary disease, etc.
- Current psychiatric treatment and medication regimen and response
- Diagnosis and indications for Electroconvulsive therapy (ECT)
- Documentation of any clinical assessment tools utilized and outcome
- Rational, risks and benefits of ECT discussed with the patient, family or guardian
- Anaesthetic consultation
- Consults as appropriate to medicine, neurology, obstetrics based on clinical assessment
- Appropriate lab tests are ordered and reviewed
- Documents on the patient record
 - Decision to proceed with ECT or maintenance ECT
 - Specific ECT treatment plans such as stimulus electrode placement
 - Alterations to medication regimen to include both pre and post treatment
 - Any special treatment considerations
- Witnessed and informed consent obtained
- Consultation from a second psychiatrist when clinically warranted

Nursing Assessment and Documentation

- Patient and family provided with information about ECT through discussion and written material
- Screening questionnaire(s) and history requirements complete including medication history
- Consultations, history and physical lab reports and any forms relevant to the ECT procedure are on the patient record
- ECT pre-checklist complete and any concerns discussed with the physician
- Patient NPO prior to therapy as per Psychiatrist and Anaesthetist order
- Vital signs including temperature (T), pulse (P), respirations (R), blood pressure and oxygen saturation (O₂ Sat) recorded and a pain rating scale (such as a 10 point Likert Scale) completed
- Dentures and hearing aids removed along with contact lens, glasses and jewellery
- Preoperative medications have been given as ordered and documented
- Patient instructed not to use hair care products or apply makeup before ECT

ECT Administration

Physician Assessment and Documentation

- Specifics of the course of ECT are reviewed prior to each treatment including
 - Index or maintenance course
 - Type of ECT (e.g. unilateral, bilateral) and stimulus electrode placement (d'Elia, Bi-temporal, Bi-frontal, other)
 - Stimulus parameters (pulse width, frequency, duration and current)
 - ECT frequency
 - Treatment number for the ECT
 - Seizure duration
 - Evidence of side effects including any cognitive effects
 - Evidence of clinical response
- Following the delivery of the stimulus the resulting seizure is observed and documented in regards to the
 - seizure activity (if any) including duration of tonic /clonic activity and EEG evidence of seizure
- Detailed documentation of the response to ECT is completed on the patient record

Nursing Assessment and Documentation

- Documents the placement of the EEG monitoring pads
- Vital signs are monitored and documented including blood pressure (BP), Pulse, respirations (R) and oxygen saturation (O₂ Sat) levels during the procedure
- EEG and EKG monitoring are done throughout the procedure
- Assess the following pre and post procedure:
 - Level of consciousness
 - Respiratory status
 - Muscle strength
 - Skin color
- Documents the response to ECT and any adverse events
- Transfers the patient to recovery

Post Procedure Management

Physician Assessment and Documentation

- Patients are monitored in the post anesthetic recovery room for an appropriate length of time as determined by the anesthetist
- Monitoring and documentation of any adverse events
- Assessment of response to treatment using standardized clinical assessment scales is recommended. ([Pre-Assessment](#)) Clinical evaluation should be ongoing.
- Recommendations for future ECT treatments are recorded and communicated
- Medication regimen and compliance is closely monitored
- Communication is provided to the primary care physician re response to treatment and follow up treatment plan following the index course of treatment

Nursing Assessment and Documentation

- Assess and document vital signs, level of consciousness, orientation, and any general complaints as per Post-Anaesthetic Recovery (PARR) room protocols
- Complete a pain rating scale (10 point Likert Scale) once the patient is awake and alert
- Detailed documentation of the recovery period including ease of recovery, any complications that have occurred
- Assist the patient as required with the resuming activities of daily living e.g. dressing, ambulating, eating
- Significant others are provided with reliable information regarding response to treatment and further treatment to optimize post anesthetic recovery
- Discharge Instructions are documented
 - Discharge into the care of responsible adult and reminded of requirement for 24 hours observation after each procedure²¹
 - The patient is strongly advised against operating a motor vehicle, machinery, or engaging in other activities that require coordination for 24 hours after each procedure²¹
 - The patient is strongly advised to not make any important financial, legal, or other decisions for 24 hours after each procedure²¹
 - The patient should be advised regarding the addictive effects of alcohol and other sedative drugs²¹
 - The patient advised to continue medications that were held prior to ECT
 - Date and time of next Electroconvulsive therapy treatment provided
- Follow-up treatment plan, and medication regimen are reviewed with the patient

Order Set – Pre- Electroconvulsive Therapy (ECT)

Restrictions for use of this set of orders: For use for patients undergoing current treatment by a psychiatrist who has prescribed electroconvulsive treatment (ECT)

Order Set Key Words: ECT, electroconvulsive therapy

Risk Assessment / Scoring Tools / Screening

- Pre-ECT checklist

Patient Care

- Informed consent obtained and witnessed

Diet

- NPO – 8 hours pre ECT treatment
- NPO – medications to be taken with sips of water as prescribed by the Psychiatrist/Anaesthetist:

Monitoring

- Vital Signs: Vital signs pre ECT procedure to include: temperature (T), pulse rate (P), respiratory rate (RR), blood pressure (BP), and oxygen saturation (O₂ sat) with options to include:
 - Continuous oxygen saturation (O₂ Sat) throughout the procedure and in the recovery room
 - A pain rating scale (10 point Likert Scale completed prior to induction)
- EEG
 - Continuous EEG monitoring throughout the procedure(s)
- EKG
 - Continuous EKG monitoring throughout the procedure(s) and in the recovery room

ECT Treatment Cycle and Dates:

- ECT Therapy Start Date _____
- Frequency _____
- Number of treatments _____
- Session Number(s) _____

ECT Treatment Parameters (per session)

- Unilateral –
 - Side _____ (Right/Left)
- Bi-temporal
- Bi-frontal
- Other _____

Laboratory Investigations

Hematology

- Complete Blood Count (CBC)

Chemistry

- Sodium
- Potassium
- Chloride
- CO₂
- Calcium
- ALT
- Bilirubin Total
- ALK Phosphatase
- Creatinine
- HCG Beta

Urine Tests

- Urine Dipstick – Point of Care testing
- Urinalysis Random
- Urine, Pregnancy

Diagnostic Investigations

- Electrocardiogram 12 Lead – *for persons with known cardiovascular disease, cardiovascular risk factors, and generally for persons age 50 and older*

Intravenous orders

- Intravenous Cannula – Insert: Initiate IV
- IV Peripheral Saline Flush/Lock – Insert: Saline Lock

Maintenance Solutions

- 0.9 % sodium chloride infusion at _____ mL/hr
- 0.45 % sodium chloride infusion at _____ mL/hr
- lactated ringers infusion at _____ mL/hr
- dextrose 5% in water infusion at _____ mL/hr
- dextrose 5% in water – 0.9 % sodium chloride infusion at _____ mL/hr
- dextrose 5% in water – 0.45% sodium chloride infusion at _____ mL/hr

Medications

- Clinical Communication:* Hold all medications prior to ECT except for those ordered by the Psychiatrist/Anaesthetist (to be taken with sips of water)

- _____
- _____

Common Analgesics

- acetaminophen _____ mg PO every 4 hours PRN (*suggested dose range 325 mg to 1000 mg. Maximum 4000 mg in 24 hours*)
- acetaminophen/caffeine/codeine 325mg/15mg/30mg _____ tablets PO every 4 hours PRN (*suggested dose range of 1-2 tablets*)

- acetaminophen/oxyCODONE 325mg/5mg _____ tablets PO every 4 hours PRN
(*suggested dose range of 1-2 tablets*)
- acetaminophen suppository _____ mg RECTALLY every four hours PRN (*suggested dose range 325 mg to 650 mg. Maximum 4000 mg/24 hours*)
- codeine _____ mg PO every 4 hours PRN (*suggested dose range of 15 mg-30 mg*)
- oxyCODONE _____ mg PO every 4 hours PRN (*suggested dose range of 5 mg-10 mg*)

NSAIDs

- acetylsalicylic acid ____ mg PO every four hours PRN (*suggested dose range of 325 mg-975mg*)
- ibuprofen ____ mg PO every four hours PRN (*suggested dose range of 200 mg-800 mg*)
- ketorolac ____ mg IM once prior to delivery of ECT (*suggested dose range 15 mg – 60 mg*)
- ketorolac ____ mg IV once prior to delivery of ECT (*suggested dose range 10 mg to 30 mg*)

Common Antinauseants

- dimenhyDRINATE _____ mg PO every 4 hours PRN (*suggested dose range of 50 mg-100 mg*)
- dimenhyDRINATE _____ mg IM every 4 hours PRN (*suggested dose range of 50 mg-100 mg*)
- dimenhyDRINATE _____ mg IV once (*suggested dose range of 50 mg–100 mg*)
- PROchlorperazine 10 mg PO every 6 hours PRN
- metoclopramide 10 mg PO every 6 hours PRN
- metoclopramide 10 mg IV every 4 hours PRN
- metoclopramide 10 mg IV once
- ondansetron _____ mg PO every 8 hours PRN (*suggested dose range of 4 mg-8 mg*)
- ondansetron _____ mg IV every 4 hours PRN (*suggested dose range of 4 mg-8 mg*)

Transitions and Referrals

- Consult Anaesthesia
- Consult Internal Medicine
- Consult Clinical Associate/Family Medicine
- Consult Cardiology
- Consult Neurology
- Consult Obstetrics (*for individuals of high risk pregnancies or in the third trimester*)
- Consult _____

Order Set – Post- Electroconvulsive Therapy (ECT)

Order Set Restrictions: For use for those patients who have just undergone ECT treatment

Order Set Key Words: ECT, electroconvulsive therapy

Order Set Requirements: (Height, Weight)

Risk Assessment / Scoring Tools / Screening

- Post ECT Checklist

Diet

- Regular Diet
- NPO
- Other: _____

Activity

- Activity as Tolerated
- Other: _____

Monitoring

- Vital Signs: Vital signs post ECT procedure to include: temperature (T), pulse rate (P), respiratory rate (RR), blood pressure (BP), temperature (T), and oxygen saturation (O₂ sat) with options to include:
 - Continuous monitoring as per post anaesthetic recovery guideline
 - Pain Rating Scale once patient awake and alert
- Mental Status, behaviour and cognition

Intravenous Therapy

- Intravenous Cannula – Remove
- IV Peripheral Saline Flush/Lock: Saline Lock Insert
- IV Peripheral Saline Flush/Lock: Remove

Medications

- Clinical Communication:* Resume current medications held prior to ECT treatment

Common Analgesics

- acetaminophen _____ mg PO every 4 hours PRN (*suggested dose range 325 mg to 1000 mg. Maximum 4000 mg in 24 hours*)
- acetaminophen/caffeine/codeine 325mg/15mg/30mg _____ tablets PO every 4 hours PRN (*suggested dose range of 1-2 tablets*)
- acetaminophen/oxyCODONE 325mg/5mg _____ tablets PO every 4 hours PRN (*suggested dose range of 1-2 tablets*)
- acetaminophen suppository _____ mg RECTALLY every four hours PRN (*maximum 3250 mg/24 hours*)
- codeine _____ mg PO every 4 hours PRN (*suggested dose range of 15 mg-30 mg*)
- oxyCODONE _____ mg PO every 4 hours PRN (*suggested dose range of 5 mg-10 mg*)

NSAIDs

- acetylsalicylic acid ____ mg PO every four hours PRN (*suggested dose range of 325 mg-975mg*)
- ibuprofen ____ mg PO every four hours PRN (*suggested dose range of 200 mg-800 mg*)
- ketorolac ____ mg IM every 6 hours PRN for pain management (*suggested dose range 15 mg – 60 mg*)
- ketorolac ____ mg IV every 6 hours PRN for pain management (*suggested dose range 10 mg – 30 mg*)

Common Antinauseants

- dimenhyDRINATE ____ mg PO every 4 hours PRN (*suggested dose range of 50 mg-100 mg*)
- dimenhyDRINATE ____ mg IM every 4 hours PRN (*suggested dose range of 50 mg-100 mg*)
- dimenhyDRINATE ____ mg IV once (*suggested dose range of 50 mg–100 mg*)
- PROchlorperazine 10 mg PO every 6 hours PRN
- metoclopramide 10 mg PO every 6 hours PRN
- metoclopramide 10 mg IV every 4 hours PRN
- metoclopramide 10 mg IV once
- ondansetron ____ mg PO every 8 hours PRN (*suggested dose range of 4 mg-8 mg*)
- ondansetron ____ mg IV every 4 hours PRN (*suggested dose range of 4 mg-8 mg*)

Transitions and Referrals

- Consult _____

Discharge

- Discharge patient
- Discharge Instructions
 - Discharge into the care of responsible adult and reminded of the requirement for 24 hours observation after each procedure
 - The patient is strongly advised against operating a motor vehicle, machinery, or engaging in other activities that require coordination for 24 hours after each procedure
 - The patient is strongly advised to not make any important financial, legal, or other decisions for 24 hours after each procedure
 - Patient advised to continue medications that were held prior to ECT treatment
 - Date and time of next Electroconvulsive therapy treatment provided
- Follow up with Primary Care Physician arranged and documented (*as required*)

Relevant Guidelines, Procedures, Protocols and Clinical Knowledge Topics

Procedures

- [AHS Procedural Sedation PS-21-02 September 2016](#)

Protocols

- [Electroconvulsive Therapy - AMH Policy E-1](#)
- [Electroconvulsive Therapy Protocol Alberta Hospital](#)
- [Electroconvulsive Therapy Protocol Centennial Centre for Mental Health and Brain Injury](#)

Additional Guidelines

- [Canadian Electroconvulsive Standards](#)
- [CPA Position Paper on Electroconvulsive Therapy 2010](#)

Clinical Knowledge Topics

- [Transcranial Magnetic Stimulation, Adult - Inpatient, Ambulatory](#)
- Appropriate Use of Antipsychotics, Adult, Inpatient

Disposition Planning

Physician

1. Considerations for hospital admission
 - Initiation of a manic or mixed state for patient with bipolar disorder
 - Acutely suicidal/risk of suicide, other risk of harm to self or others
 - Status Epilepticus
 - Worsening mental and physical condition
2. Considerations for Discharge. Discharge only if the patient meets the following criteria:
 - Aldrete Recovery score of 8 or greater is considered adequate for discharge or alternately, recovery to a Ramsay Sedation Scale score of two constitutes reasonable recovery to permit discharge
 - Any patient that does not reach an Aldrete recovery score of 8 or a Ramsay Sedation Scale score of two, the patients baseline level of assessment, or has experienced any complications during the procedure shall be monitored post procedure in an appropriate clinical area
 - Patient is discharged in the care of a responsible adult with instructions and contact information²¹
 - The patient is strongly advised against operating a motor vehicle, machinery, or engaging in other activities that require coordination, and not to make any important financial, legal or other decisions for the next 24 hours after each procedure²¹.
 - The patient is advised to continue medications that were held prior to ECT treatment
 - The patient should be advised regarding the addictive effects of alcohol and other sedative drugs
3. Considerations for Transfer: The authorized prescriber may authorize the transfer of the patient to an alternate clinical area or site if deemed necessary or appropriate
 - The patients Aldrete Recovery score or Ramsay Sedation Scale score shall be assessed prior to transfer and recorded prior to transfer to an alternate clinical area.
 - Only be transported if the patient is accompanied by a health care professional competent to both monitor the patient and provide care in an emergency situation
4. Outpatient follow-up
 - Follow up instructions provided to primary care physician and follow-up date arranged. Patient for options discussed for continuing on going therapy e.g. psychotherapy such as cognitive behavioral therapy
 - Medication regimen documented
 - Scheduled follow up ECT sessions
 - Patient provided with instructions re follow up treatment including completing self-assessments, appointments and to report any adverse events

Nursing/Technician

1. Patient checklist for discharge readiness from the clinic:
 - Treatment record form completed
2. Education to be provided prior to discharge from the clinic:
 - Patient aware of follow up ECT appointments
 - Reporting any adverse events to the Psychiatrist, Primary Care Physician and ECT team
 - Detailed follow up of any psychotherapy treatment

- Medication regimen reviewed
3. Education tools/resources to be provided prior to discharge
 - Written instructions regarding the treatment and what to expect
 4. Follow-Up Instructions
 - Instructions provided with continuing on going treatment
 - Follow up scheduled with treating Psychiatrist
 - Follow up scheduled with Primary Care physician
 - Report any adverse events, worsening condition, mental status

Analytics

Baseline Analytics – Outcome Measure#1

Name of Measure	# of times the order set Pre-Electroconvulsive Therapy is utilized # of time the order set Post-Electroconvulsive Therapy is utilized
Definition	For all patients who undergo Electroconvulsive Therapy the number of times the order set(s) Pre-Electroconvulsive Therapy and Post Electroconvulsive Therapy is used. Overall by region, by sites and by units.
#Rationale	Intended to measure if the order set sited in the knowledge topic is being use and what percentage of time .This may indicate areas with adoption issues or gaps in the topic.
Notes for Interpretation	Health record must have coding for disease/condition, site capacity, rural considerations, roll out of provincial CIS
Cited References	1. Canadian Network for Mood & Anxiety Disorders. Guidelines for the Management of Adults with Major Depressive Disorder. Can J of Psychiatry. Section 4: Neurostimulation Treatments 2016; 61(9): 561-575n/a

Baseline Analytics – Outcome Measure#2

Name of Measure	Length of stay comparison for patients admitted with a major depressive episode for those who have received electroconvulsive therapy (ECT) to those who have not received electroconvulsive therapy.
Definition	Patients who are admitted with major depressive episode a comparison of length of stay for those who have received ECT treatment versus those who have not received ECT treatment
Rationale	This is intended to provide an analysis for patients admitted with major depressive episodes that providing ECT therapy can reduce the length of stay for patients.
Notes for Interpretation	The number of times the patient is admitted and readmitted for a major depressive episode would need to be captured to assist with analysis.
Cited References	1. Canadian Network for Mood & Anxiety Disorders. Guidelines for the Management of Adults with Major Depressive Disorder. Can J of Psychiatry. Section 4: Neurostimulation Treatments 2016; 61(9): 561-575 n/a

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