CHIEF PSYCHIATRIST
of Western Australia

Chief Psychiatrist's Guidelines for the use of

Electroconvulsive Therapy

in Western Australia 2024

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Version Control

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We acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of our State and its waters. We pay our respects to Elders who were, who are and who will be, and extend this to all Aboriginal and Torres Strait Islander peoples seeing this message.

We acknowledge the individual and collective expertise of those with a living or lived experience of mental health, alcohol and other drug issues. We recognise their vital contribution at all levels, and value the courage of those who share this unique perspective for the purpose of learning and growing together to achieve better outcomes for all.

We are committed to embracing diversity and eliminating all forms of discrimination in the provision of health and mental health services.

Table of contents

Table of contents iii

Introduction 1

ECT's place in modern mental health care 1

ECT in Western Australia 2

Where can ECT be given? 2

When can ECT be used? 2

How is ECT treatment given? 2

Aim of the Guidelines 3

Terminology used in the Guidelines 4

Guideline 1: Indications for ECT 5

1.1 Depression 5

1.2 Schizophrenia and psychotic disorders 6

1.3 Manic episode 6

1.4 Catatonia 7

1.5 Neuroleptic Malignant Syndrome (NMS) 7

1.6 Other indications 8

1.7 ECT in special populations 8

1.7.1 Older adults 8

1.7.2 Pregnancy 9

1.7.3 Children and adolescents 10

Guideline 2: Risks of ECT 11

2.1 Cardiovascular risks 11

2.2 High risk situations 12

2.2.1 Recent myocardial infarction 12

2.2.2 Unstable angina 12

2.2.3 Poorly compensated congestive cardiac failure 13

2.2.4 Cardiac pacemakers and implanted cardiac defibrillators 13

2.2.5 Aortic and cerebral aneurysms 13

2.2.6 Cerebral haemorrhage and infarction 14

2.2.7 Intracranial space occupying lesions 14

2.3 Cognitive risks of ECT 14

2.3.1 Acute cognitive effects 15

2.3.2 Anterograde memory effects 15
2.3.3 Retrograde memory effects 16
2.3.4 Non-memory cognitive effects 16
2.4 Musculoskeletal risks 17
2.5 Other patient factors which may increase risk 17
2.5.1 Poor dentition 17
2.5.2 Obesity 17
2.5.3 Asthma and chronic obstructive pulmonary disease (COPD) 17
2.5.4 Osteoporosis 17
2.5.5 Endocrine disorders 18
2.5.6 Retinal detachment and glaucoma 18
2.5.7 Skull defects and titanium plates 18
2.5.8 Deep brain stimulators 18
2.5.9 Post surgery 18
Additional notes 18
Guideline 3: The ECT Legal Framework 19
3.1 Prescribing ECT 19
3.2 Rights of patients 19
3.3 Rights of families and support persons 20
3.4 Consent 21
3.4.1 MHA 2014 requirements for consent for ECT 21
3.4.2 Provision of information 23
3.4.3 Content and duration of the consent 24
3.4.4 Duration of the consent 24
3.5 Capacity 25
3.6 Supported decision making 25
3.7 Substitute decision making and guardianship 26
3.8 Advance Health Directives 27
3.9 The Mental Health Tribunal 27
3.10 The Mental Health Advocacy Service 29
3.11 Nominated persons 29
Guideline 4: ECT Service Delivery 30
4.1 ECT facility and equipment 30
4.1.1 Waiting room 30

4.1.2 Treatment room 30
4.1.3 Anaesthesia requirements 31
4.1.4 ECT equipment 31
4.1.5 Recovery room 31
4.2 Staffing of ECT services 32
4.2.1 Minimum staffing requirements 32
4.2.2 Leadership 32
4.2.3 Medical staff 32
4.2.4 The ECT Nurse Coordinator 34
4.2.5 ECT nurses 34
4.3 Safety, quality, and service improvement 35
4.3.1 Governance, leadership, and culture 36
4.3.2 Patient safety and quality systems 36
4.3.3 Clinical performance and effectiveness 37
4.3.4 Safe environment for the delivery of care 38
4.4 Documentation and reporting 38

Guideline 5: Preparing the Patient for ECT 40

5.1 Pre-ECT workup 40
5.1.1 Psychiatric examination 40
5.1.2 Medical history and examination 40
5.1.3 Priority investigations 40
5.1.4 Other investigations 41
5.1.5 Consultations with other specialists 41
5.1.6 Dental assessment 41
5.1.7 Anaesthetic assessment 41
5.1.8 Baseline and post treatment measurement 41
5.1.9 Medication review 42
5.2 Suitability for outpatient ECT 43

Guideline 6: Anaesthesia 44

6.1 Anaesthesia standards 44
6.2 Staffing 44
6.3 Anaesthesia consultation 44
6.4 Fasting 45
6.5 The anaesthetic 45

6.6 Monitoring **46**
6.7 Recovery **46**
6.8 Complications **46**

Guideline 7: ECT Treatment Approaches **48**

7.1 ECT electrode placement **48**
7.1.1 Unilateral placement 48
7.1.2 Bitemporal placement 49
7.1.3 Bifrontal placement 50
7.1.4 Left anterior right temporal placement (LART) 50
7.2 Pulse width **51**
7.3 Seizure threshold and initial treatment dose **52**
7.3.1 Measuring the seizure threshold 52
7.4 Frequency and number of treatments **54**
7.5 ECT administration in pregnancy **54**
7.6 ECT administration for children 14 - 17 years old **55**

Guideline 8: ECT Administration **56**

8.1 Preparation **56**
8.2 Patient identification and procedure matching **56**
8.3 Pre ECT checklist **57**
8.4 During the procedure **57**
8.4.1 Electrical contact: impedance and skin preparation 57
8.4.2 Protecting the teeth 58
8.4.3 Isolated limb technique 58
8.4.4 Team Time Outs 59
8.4.5 ECT administration 59
8.5 Monitoring during treatment **60**
8.5.1 Monitoring during anaesthesia 60
8.5.2 Monitoring the seizure 61
8.5.3 Missed or inadequate seizures 62
8.5.4 Prolonged seizures 63
8.6 Completion of treatment **63**
8.7 Post ECT Care **63**

Guideline 9: Monitoring Between Treatments **66**

9.1 Assessing patient response to treatment **66**

9.2 Lack of response to ECT **66**
9.3 Stimulus dose changes during treatment course **67**
9.4 Assessment of memory function **68**
9.4.1 Formal cognitive screening 68
9.4.2 Managing deterioration of cognitive functioning 69
9.5 Managing other adverse events **69**
Guideline 10: Continuation and Maintenance ECT **71**
10.1 Augmentation of cECT and mECT with pharmacotherapy for depression **71**
10.2 Indications for mECT **71**
10.3 Conclusion of index ECT, frequency of mECT and end of mECT course decisions **72**
10.4 Inpatient vs. Outpatient cECT and mECT **73**
Appendix 1: Medications and ECT **74**
Appendix 2: Abbreviations **79**
Development of the guidelines **81**
Acknowledgement of contributors **81**
Resources and related documents **82**

Introduction

ECT's place in modern mental health care

Electroconvulsive Therapy (ECT) is a therapeutic medical procedure used to treat severe psychiatric disorders. Its primary purpose is to rapidly relieve symptoms, especially in situations where other treatments have not worked, or are not fast acting enough.

It is a form of neurostimulation which involves the delivery of a small electrical current to the brain to induce a brief seizure for therapeutic purposes, while the patient is under anaesthetic. It is well established as a safe and effective evidence-based treatment for a range of conditions.

ECT emerged in the early 20th century as a treatment for catatonia and depression, and was first carried out in Australia in 1942. Despite the appearance in the intervening years of new medications and other interventions, ECT maintains its place in the range of effective treatments available for severe and disabling mental illness. It remains a first line treatment for life threatening mental health conditions, when a rapid response is necessary. The research base for ECT has continued to develop and grow over the years.

It is important to acknowledge that in the past ECT may have been subject to use which is now considered inappropriate, and concerns may still linger in the public mind in relation both to this, and to the side effects particularly associated with older forms of ECT. Media representations of ECT have not always reflected modern ECT practice and people often approach ECT for the first time with some apprehension.

However, many people have found ECT to be a lifesaving and life-changing treatment. It remains in use because of its efficacy, and because of the dramatic impact it can have for people with severe illness, and its impact where other treatments have not worked. Its efficacy, particularly in severe depression, has been robustly demonstrated in clinical trials, and the evidence base continues to evolve and grow. Advances in the delivery of ECT, and in ECT anaesthesia, have ensured that modern forms of ECT are safe, effective, and have significantly reduced, although not eradicated, unwanted side effects such as memory impairment.

Treatment decisions are complex and individual, and consent to ECT requires consideration of both the treatment itself and the general anaesthetic required. Services must make sure that consumers and their support people are provided with everything they need to make informed decisions, are involved in decision making to the maximum extent possible, have the opportunity and time to think and consult, and are aware of their rights and options at every stage.

ECT in Western Australia

In WA, the *Mental Health Act 2014* (MHA 2014) provides the legal framework for all ECT treatment, and all ECT service provision in the state.

Where can ECT be given?

ECT services are highly regulated. In Western Australia, ECT can only be administered by mental health services approved by the Chief Psychiatrist under s. 544 of the MHA. To be approved, services must meet requirements in relation to their facilities, equipment, staffing, training, and governance. These are described in Guideline 4 – ECT Service Delivery.

A Register of approved ECT suites can be found on the Chief Psychiatrist's website.

When can ECT be used?

There are strict rules and requirements that must be met for consent for ECT to be valid, and these are described in Guideline 3 – The ECT Legal Framework.

As for any decision about treatment, it is expected that all patients and their support people will be given all the information and support they need to make an informed choice. ECT should be provided on a voluntary basis wherever possible, but when a person lacks capacity, services should take active steps to support decision making and continue to involve them, and wherever possible their support person(s), in all decisions.

In situations where ECT is recommended for a patient who is on an involuntary treatment order under the MHA 2014 due to the severity of their illness, a hearing of the Mental Health Tribunal is also held to decide whether the treatment should go ahead. The Mental Health Advocacy Service provides support to people who are subject to the MHA 2014 to help them understand their rights, ensure they are able to exercise them, and make sure that their views and wishes are heard.

There is also provision under the MHA 2014 for ECT to be given in an emergency situation, to save a person's life. There are strict rules about who can approve this sort of ECT.

The MHA 2014 also requires the Chief Psychiatrist to publish a statutory standard, and guidelines for the performance of ECT (s. 547 (1) (f)). There are specific age restrictions, rules around consent and reporting requirements (s. 211) to the Chief Psychiatrist, which must be adhered to.

How is ECT treatment given?

ECT is given by specialist teams that include anaesthetists, psychiatrists, and specialist nurses. After a psychiatrist prescribes ECT, a careful assessment must occur before the treatment, to make sure that both the ECT and the anaesthetic will be safe. ECT can often be safely given even to people with serious medical problems, but sometimes additional medical reviews and tests are needed before the treatment to manage any problems.

Aim of the Guidelines

The MHA 2014 requires a medical practitioner performing ECT to have regard to these guidelines (s.195-199).

It also requires the Mental Health Tribunal to have regard to these guidelines, when deciding whether to approve ECT for an individual patient (s.413).

The aim of these guidelines is therefore to:

- Support the objects of the MHA 2014, the rights of individuals and their support people, and the Charter of Mental Health Care Principles.
- Support psychiatrists and other clinicians to ensure that patients in WA receive safe, high-quality evidence-based care.
- Support the safety and standardisation of practice across mental health services in WA.
- Assist the MHRT in its decision making.
- Provide information about ECT.

The guidelines should be read in conjunction with the Chief Psychiatrist's Standards for the Administration of Electroconvulsive Therapy in WA, which describe the statutory minimum standards that all services and clinicians must adhere to.

Because the treatment of individuals can be complex, and evidence continually evolves, a single guideline cannot hope to cover all aspects of ECT treatment. These are best practice guidelines, with recommendations for clinical practice made in the text.

The guideline is a requirement of the MHA 2014 as part of the regulation of ECT in WA, and is not intended or able to provide comprehensive coverage of other available treatment options, or other types of neuromodulation such as Transcranial Magnetic Stimulation (TMS). For more information about TMS, see RANZCP Professional Practice Guide.

Terminology used in the Guidelines

Consumer/patient

We have used the term "consumer" to refer to groups of people who have used or may use mental health services, and the term "patient" to refer to a person receiving treatment, and when quoting from the MHA 2014, as this is the term used in the Act.

Support person

We have used the overarching term 'support person' to refer to a family member, carer or personal support person for a mental health consumer.

Aboriginal

Within Western Australia, the term 'Aboriginal' is used in preference to 'Aboriginal and Torres Strait Islander', in recognition that Aboriginal people are the original inhabitants of Western Australia. No disrespect is intended to Torres Strait Islander colleagues and community.

Children

The MHA 2014 refers to anyone under the age of 18 as a child, so the term 'child' or 'children' has been used in preference to terms such as young person, when referring to anyone under 18.

Guideline 1: Indications for ECT

ECT is an effective and well-established treatment for a range of severe psychiatric conditions, especially when a rapid response is needed due to the severity of the illness. Many people have experienced ECT as life-saving, or extremely beneficial, at times when they have been very unwell and in severe distress.

However, it is also a treatment which has potential adverse effects, and which is known to have been experienced as distressing and invasive by some. The choice of ECT must be based on the evidence for its efficacy for a particular clinical indication, the risks and benefits specific to the individual, their preferences and that of their support people.

For some conditions, such as depression, the efficacy of ECT is well supported by evidence from randomised control trials and meta-analysis.

For other conditions, ECT is a well-recognised and frequently utilised treatment, but the type of evidence for its use is largely expert opinion and observational studies, supported by professional and consensus guidelines.

The limited evidence base for some indications for ECT has several explanations, such as gaps in the research due to ethical considerations in conducting ECT research, and the varied nature of both psychiatric diagnostic categories and forms of delivery of ECT. Despite this, there are many well documented areas of consensus.

A summary of the literature supporting the use of ECT can be found in the Royal Australian and New Zealand College of Psychiatrists Electroconvulsive therapy professional practice guideline (RANZCP PPG).

Prescribing and consent for ECT, and the MHA 2014 requirements for the lawful provision of ECT in WA are described in Guideline 3 – The ECT Legal Framework.

1.1 Depression

Major depression has the strongest evidence base as an indication for ECT and is the most common indication in practice. The literature offers evidence for superior efficacy of ECT in severe depression, particularly depression with psychotic features or catatonic features in all age groups. It is a treatment of significant importance in older people with depression.

ECT is a **first line treatment** where an emergency intervention is required in life threatening situations including severe depression with:

- Inability to maintain adequate nutrition and fluid.
- High risk of suicide.
- High risk to mother or foetus in pregnancy.

Other indications may include:

- Severe depression with psychomotor agitation or retardation, distress, psychotic features, or catatonia.
- Treatment resistant depression which has previously responded to ECT.
- Treatment resistant depression where the patient has not responded to adequate trials of medication and psychotherapy or where medication cannot be tolerated due to side effects.
- Depression in the puerperal period (up to six weeks post childbirth).
- Depression in older age (see 1.7.1).
- Depression where there has been a previous good response to ECT or where it is the patient's preference.

1.2 Schizophrenia and psychotic disorders

As pharmacotherapy has evolved, ECT is now less commonly used in the treatment of schizophrenia than was the case in the past. However it retains a place in the treatment of severe illness.

There is a shortage of well-designed, large-scale studies that explore the role of ECT in the treatment of schizophrenia. Therefore, it is difficult to determine definitive guidelines on its use. The role of ECT in chronic treatment-resistant schizophrenia is unclear but may be of benefit in some cases.

Indications include:

- Acute episodes of schizophrenia or schizoaffective disorder which have not responded to medication, and where a rapid response is required because of significant risk, or where severe mood symptoms are significant.
- Schizophrenia with catatonia.

ECT may be considered for:

- Some cases of treatment resistant schizophrenia with inadequate response to clozapine.
- Puerperal (postpartum) psychosis (see 1.7.2, 7.5).
- Previous good response to ECT, or where it is the patient's preference.

1.3 Manic episode

Prior to the advent of effective pharmacological treatments, ECT was used more extensively in the treatment of mania. The evidence base for using ECT to treat mania is not as strong as it is for other conditions due to the lack of large-scale high-quality trials.

ECT may be considered for:

- Emergency treatment for mania, where a rapid response is required due to physical compromise or risk.
- Mania which has not responded to trials of medication, or where medication is not tolerated and ECT may be a safer option.
- Where there has been a previous good response, or it is the patient's preference.

1.4 Catatonia

The abnormalities of movement and behaviour seen in catatonia have several possible causes including mood disorders, psychotic disorders, autism, and some infectious, metabolic, and neurological conditions.

It shares common features with Neuroleptic Malignant Syndrome (see 1.5) of high temperature (hyperpyrexia) and muscle rigidity, but it is usually preceded by behavioural agitation or psychosis.

The treatment approach for catatonia includes supportive measures, treating the underlying disorder, use of benzodiazepines and consideration of ECT. The same approach is used regardless of the underlying pathology.

ECT is considered an effective treatment for catatonia when a rapid response is required. However although widely used in clinical practice, there is a lack of high-quality trials supporting the efficacy of ECT in catatonia, as most of the evidence is drawn from case reports.

1.5 Neuroleptic Malignant Syndrome (NMS)

NMS is a rare but life-threatening neurological emergency that can occur following the use of antipsychotic medications. The clinical features are like those of catatonia with the addition of severe autonomic nervous system dysfunction.

Its management includes stopping any precipitating medication and supportive care. In addition, other medications and ECT have also been used.

Evidence for the use of ECT (in combination with benzodiazepines) to treat NMS is largely based on clinical experience and case reports. However, given the lack of evidence of other treatments, and the life-threatening nature of the disorder, ECT has been widely used for this indication.

Careful consideration is required of the need to manage the autonomic instability, and associated anaesthetic risk.

1.6 Other indications

In addition to the more well-established indications, there is potential application of ECT, based on case reports, in the following, provided there is a mental illness as part of the condition:

- Severe agitation in dementia
- Post-traumatic stress disorder
- Neuropsychiatric symptoms in Huntington's Disease
- Wilson's disease
- Somatic symptom disorder
- Delirium
- Neurosyphilis
- Gilles de la Tourette syndrome
- Obsessive compulsive disorder
- Tardive dyskinesia
- Severe Parkinson's Disease
- Intractable temporal lobe epilepsy
- Repetitive self- injurious behaviours in severe autism.

ECT is not routinely used in clinical practice for these indications as there is currently little research evidence to establish its efficacy. If it is being considered for one of these indications, decision making should only occur in consultation with a psychiatrist with expertise in the use of ECT.

1.7 ECT in special populations

1.7.1 Older adults

Older age has been associated with an increased rate of response (particularly for depression) and improvement in quality of life following treatment with ECT.

Overall, the literature indicates that with good patient selection, ECT can be an effective and safe treatment option for elderly patients with major depression, even in very old-old age (>85 years).

However, as older age patients often have more medical co-morbidities, there are often increased risks associated with the anaesthesia and the physiological effects of the seizure.

There is a possible increased risk of delirium associated with age.

This additional risk increases with the number of treatments given in the course of ECT. However, this has to be balanced against the risks of the underlying illness, and the risks of drug interactions or adverse effects related to medication, which also increase with age and comorbidity.

The cognitive side-effect profile for ECT in older people has been found to be comparable to that of mixed age populations, and baseline cognitive impairment does not necessarily preclude a patient from having ECT.

Continuation ECT (C-ECT), has been shown to be at least equivalent to continuation pharmacotherapy in effectiveness, and maybe a useful alternative for elderly patients who cannot tolerate medications or who relapse on adequate post-ECT pharmacotherapy after a successful course of ECT.

Recommendations for Clinical Practice

- ECT is an effective option for major depression in old age and is often safe and well tolerated.
- The risks and benefits of ECT in older people, especially those with medical comorbidities, should be weighed against those of medication, where that is the likely alternative therapeutic option.
- ECT is not suitable for all, especially those with medical frailty.
- Medical comorbidities need to be managed and a careful risk benefit analysis is required for each person.
- Elderly people with cognitive impairment can usually proceed to ECT with appropriate measures to reduce post-ECT confusion such as reduced treatment frequency, right unilateral electrode placement, and ultrabrief pulse stimulus.

1.7.2 Pregnancy

Depression in the perinatal period is common. Untreated maternal depression has been associated with adverse pregnancy outcomes including premature birth, low birth weight, and foetal growth restriction.

There are significant risks of teratogenesis associated with some psychotropic medications including mood stabilisers in the first trimester of pregnancy, and many psychotropic medications are problematic in the late stages of pregnancy due to neonatal toxicity. This can limit the therapeutic options available during pregnancy.

In general, the adverse effects of ECT in pregnancy are similar to those for people who are not pregnant. No teratogenic risks have been associated with brief exposure to the anaesthetic agents commonly administered with ECT, although evidence is limited. Rates of miscarriage following ECT have not been found to be significantly different from those in the general pregnant population.

However, a rare risk has been noted in later pregnancy of premature contractions and preterm labour. The relationship with the ECT treatment itself has not been clarified.

There have been no associations of ECT given in pregnancy with congenital anomalies or neurocognitive disturbances in the baby.

ECT in pregnancy requires a multidisciplinary team approach with obstetrics, maternal-foetal medicine, psychiatry, and anaesthetics, but is overall considered to be safe and effective.

Recommendations for Clinical Practice

- Pregnancy is not a contraindication to ECT, when there is careful planning and monitoring by a multidisciplinary specialist team.
- ECT has been used safely in second and third trimesters. Evidence relating to the first trimester is limited.
- Risks of ECT must be weighed against the potential risks associated with exposure of the baby to psychotropic medication, and the risk to both mother and baby of no treatment.
- ECT can be used safely in the post-partum period. Women can continue to breastfeed.
- The most common indications for the use of ECT are severe depression with peripartum onset, and puerperal psychosis.

1.7.3 Children and adolescents

It is an offence to perform ECT on a child who has not reached 14 years of age

There are limited studies and no controlled trials exploring the efficacy of ECT in children and adolescents. From the evidence available, no difference has been suggested in the effectiveness and safety of ECT in adolescents, when compared with adults across the same range of indications.

Recommendations for Clinical Practice

- There is no evidence that ECT adversely affects the developing brain, but the evidence base for ECT in children is limited.
- There are no absolute contraindications to ECT in children aged 14 and over, and the indications, predictors of response and adverse effects in adolescents are thought to be similar to those in adults.
- ECT may be considered where symptoms are serious and disabling enough to threaten the child's life (for example, refusal to eat or drink, or high and unrelenting suicide risk) or to cause persistent and grave disability; and/or where severe illness is resistant to other treatment or where the child is unable to tolerate medication due to serious side-effects.
- A decision to use ECT must always involve both a Child and Adolescent psychiatrist and a psychiatrist experienced in ECT. Further discussion of the requirements for decision making and consent for children are found in Guideline 3 – The Legal Framework.
- A psychometric assessment should be performed at baseline and at six months after the completion of ECT where possible.

Guideline 2: Risks of ECT

ECT is established as a safe procedure when it is performed by a qualified team in a dedicated clinical setting. However co-occurring medical conditions may increase the risks associated with both anaesthesia and ECT.

ECT is not suitable for everyone, and the balance of risks and benefits for each person must be assessed. This means weighing up potential risks and adverse effects from the treatment against risks from an untreated mental health disorder, which may be significant.

Where there are concurrent medical conditions which may increase the risk of adverse events from ECT, it is important to consult relevant medical specialists.

2.1 Cardiovascular risks

ECT treatment increases cardiac demands in various ways, and complications such as cardiac ischaemia and even myocardial infarction can occur.

The very low mortality associated with ECT is mostly attributable to such events, and is generally associated with pre-existing cardiac disease. It is imperative that every patient's cardiovascular status is robustly assessed and managed. However once cardiovascular conditions are stable, many patients can safely complete an ECT course.

Patients with active cardiac conditions (e.g., unstable angina, poorly compensated congestive cardiac failure, severe valvular heart disease, significant arrhythmias, uncontrolled hypertension) are at the highest cardiac risk, and should only receive ECT in the most critical circumstances. Involvement of a cardiologist is advised.

The risk-benefit of stimulus dose titration must be carefully assessed in patients with cardiac disease as sub-convulsive stimuli may increase the risk of bradycardia and asystole.

In patients at risk of prolonged asystole and arrhythmias during ECT, careful consideration of electrode placement is recommended. Preliminary research suggests that bi-frontal placement is associated with less asystole than bi-temporal and right unilateral placements.

Cardiac Effects of ECT

The electrical stimulus causes vagal stimulation. During and immediately following the electrical stimulus, sinus bradycardia, asystole and hypotension may occur due to this pronounced parasympathetic surge.

Post-stimulus asystole is associated with pre-existing unstable cardiac disease, older age, use of beta blockers, hypoxia and use of an acetylcholinesterase inhibitor.

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Cardiac Effects of ECT, continued…

When a seizure occurs, significant levels of catecholamine are released into the circulation, which reverses the parasympathetic surge and corrects any bradycardia.

Subthreshold seizures are therefore undesirable in patients with cardiac disease.

However, this increased sympathetic outflow and adrenal catecholamine release during the seizure means that significant tachycardia and hypertension may occur.

This increases myocardial oxygen demand and may result in cardiac ischemia. These transient physiological effects at the time of the seizure are often refractory to medications.

The increase in blood pressure during the seizure can be associated with cerebrovascular events.

Immediately following the seizure, a fall in heart rate and blood pressure back to pre-treatment levels usually occurs.

However, some patients can experience persisting hypertension and tachycardia during this post-ictal period.

Arrhythmias may occur, commonly ectopic beats, bigeminy and supra-ventricular tachycardia, but most are transient and resolve spontaneously.

2.2 High risk situations

2.2.1 Recent myocardial infarction

The risk is highest in the first month after a myocardial infarction, and ideally patients should wait at least 3 months before commencing ECT. Arrhythmia and, less commonly, myocardial rupture, are possible serious complications.

There is little robust evidence to guide clinical decision-making in this situation. Consultation with a cardiologist, and careful consideration of the risk-benefit balance for the individual is required.

2.2.2 Unstable angina

The administration of ECT places physiological stress on the heart, increasing the risk of myocardial ischaemia in these conditions.

Consultation with a cardiologist, and careful consideration of the risk-benefit balance for the individual is required.

2.2.3 Poorly compensated congestive cardiac failure

Poorly compensated congestive cardiac failure (CCF) refers to chronic CCF that is poorly controlled by medication. ECT places extra stress on the heart which may precipitate respiratory failure.

Consultation with a cardiologist, and careful consideration of the risk-benefit balance for the individual is required.

2.2.4 Cardiac pacemakers and implanted cardiac defibrillators

Cardiac pacemakers generally protect against the marked changes in heart rate that usually occur with the administration of the ECT stimulus and the subsequent seizure. However, in rare instances pacemakers may over sense when exposed to Electro Magnetic Interference (EMI), which can result in inhibition of the pacemaker. Implanted cardiac defibrillators (ICD) may misinterpret the EMI and the benign tachyarrhythmias that occur during seizures as ventricular tachycardia and deliver a shock. The unnecessary discharge of the ICD might initiate a true ventricular arrhythmia.

Prior to commencing ECT, a report giving details of the pacemaker should be sought. The report should include the indications for the pacemaker, the patient's underlying rhythm, and the effect of placing a magnet.

To minimise the risk of a depleted battery or lead problem, it is recommended that the pacemaker has been interrogated within the last 12 months. If not done or unknown, this can be arranged before treatment with a cardiac technician.

The patient's cardiologist and the device manufacturer should be consulted to determine whether the pacemaker needs to be switched to 'fixed rate' (asynchronous mode) from 'demand mode', though this is usually unnecessary with modern devices.

Alternatively, a magnet can be placed over the device during delivery of therapy to force pacing in asynchronous mode in the unlikely event of pacemaker inhibition and prolonged asystole.

It is recommended that patients with pacemakers and IDC's have cardiac monitoring during ECT. This is undertaken by applying cardiac monitoring pads on the patient's chest to check on the cardiac status during and after the procedure.

2.2.5 Aortic and cerebral aneurysms

Hypertension associated with the seizure could increase the risks of an aneurysm rupturing. Instances of this occurring have been observed. However there have also been several reports of the safe administration of ECT in patients with aneurysms.

Consultation with vascular or neurosurgery is advised.

2.2.6 Cerebral haemorrhage and infarction

Depression is common after stroke and commonly associated with cerebral small vessel disease seen on magnetic resonance imaging (MRI). Consequently, ECT is often considered for people with pre-existing cerebrovascular disease. The increase in blood pressure and cerebral blood flow that occur with the seizure pose a theoretical risk of a previous stroke re-infarcting or re-bleeding. There are some case reports of strokes occurring in the hours following ECT; whether there is a causal link remains unknown.

It is advisable to consult with a neurologist prior to considering ECT regarding the risk of further stroke due to changes in blood pressure.

2.2.7 Intracranial space occupying lesions

Intracranial pressure that has been increased by a space-occupying lesion may be increased further by ECT, possibly leading to coning. The risk can be reduced with diuretics, steroids, antihypertensives and hyperventilation. Small slow growing masses are unlikely to cause problems.

It is advisable to consult with anaesthetist, neurology and neurosurgical colleagues before proceeding with ECT.

2.3 Cognitive risks of ECT

The occurrence of cognitive side-effects with ECT is well recognised and is a major source of concern for patients undergoing treatment Patients may experience acute cognitive effects at the time of treatment, interference with their ability to learn new information, and loss of personal memory, with the last often described as the most distressing.

It is important to note that the conditions most commonly treated with ECT are also associated with significant cognitive impairment. Most research has been conducted in patients receiving ECT for major depression. Many patients report an improvement in memory and cognition as their depression improves after treatment with ECT.

Research has therefore aimed to correct for the underlying illness and understand the incidence and severity of cognitive deficits that are specifically associated with the ECT itself.

Studies have also aimed to optimise ECT technique to maintain its efficacy whilst minimising cognitive side-effects.

It is recognised that a small proportion of people report persistent, long-term deficits in memory. This is a major source of concern for people considering ECT, and is a vital risk to discuss as part of the consent process.

2.3.1 Acute cognitive effects

This refers to memory problems immediately after ECT treatment.

Mild disorientation immediately after ECT is common and usually lasts from minutes up to two hours, resolving without intervention.

- The anaesthesia as well as the ECT contributes to this temporary disorientation.
- Orientation to person, place and time generally recover at different rates, with orientation to time generally the slowest to recover.
- The duration of disorientation is greater with sine-wave stimuli, bitemporal electrode placement, a higher number of treatments in an episode of ECT and higher dose above seizure threshold.
- Some evidence suggests that longer duration of post-ictal disorientation predicts the severity of retrograde amnesia after ECT.
- Routine measurement of disorientation may be useful in identifying those patients at higher risk of developing retrograde amnesia, enabling alterations in treatment technique to minimise the risk.
- Length of disorientation is either measured as 'time to re-orientation' or 'level of disorientation at 30 minutes post-ECT'.

Post-ECT delirium is a condition of confusion and behavioural agitation that commences in the recovery room after ECT and usually lasts for minutes to a couple of hours.

- It should be managed in conjunction with the ECT anaesthetist, who will need to monitor the patient in recovery until the agitation resolves.
- Olanzapine, droperidol, midazolam, a further dose of propofol and dexmedetomidine have been shown to be helpful.
- There can be rare occurrence of a persistent delirium that emerges during a course of ECT. ECT should be suspended until this delirium resolves.

2.3.2 Anterograde memory effects

Anterograde memory refers to the acquisition of newly learned information after the ECT has commenced.

Difficulty with both the acquisition and retention of new verbal and non-verbal material is frequently observed during and immediately after a course of ECT.

Deficits in memory retention are generally more marked and are often slower to recover than those in acquisition.

Anterograde memory function generally returns at least to pre-ECT baseline levels within weeks and almost always within two months, and performance often improves during this period, relative to baseline.

Longer-term follow-up studies have also demonstrated improvement in performance relative to baseline scores.

However, one of the largest studies investigating long-term memory outcomes following ECT reported that cognitive effects can persist at 6-month follow-up, though ECT parameters, and bilateral lead placement specifically, contributed to these findings.

2.3.3 Retrograde memory effects

Loss of key personal memories, if it occurs, can be the most distressing cognitive impairment for patients to experience.

Retrograde memory refers to the recall, after ECT has commenced, of information that was already learnt prior to ECT. It includes autobiographical memory: information personally experienced and impersonal memory (learnt information e.g. news events, recently learned professional tasks and skills.)

Deficits in both autobiographical and impersonal memory can occur and tend to be most severe immediately after the index course. More recent memories tend to be more vulnerable than more remote memories, although some patients have reported the loss of memories dating back several years.

Although retrograde amnesia generally improves over several weeks following an index course, persistent deficits have been demonstrated in patients receiving bitemporal ECT when compared to right unilateral ECT, both at one to two months after the course, and at longer-term follow-up.

In a systematic review of the literature conducted to ascertain patients' perspective on ECT, one in three patients reported lasting retrograde memory loss, although another study has suggested this is an overestimate. The authors of both reviews concluded that loss of autobiographical memory is widely described but insufficiently systematically investigated.

2.3.4 Non-memory cognitive effects

Studies of the effects of ECT on cognitive domains such as executive function, attention, information processing speed, and general intellect are relatively few and have yielded mixed results presumably as a result of variations in study populations and methodology.

2.3.4.1 Minimising cognitive effects

Evidence suggests that the use of ultrabrief pulse width ECT (pulse width of 0.3 milliseconds [ms]) significantly reduces the cognitive side-effects of right unilateral ECT and may prove to have an important role in reducing the cognitive side-effects of ECT.

However, there is evidence that patients treated in this way could have a greater number of treatments and stay longer in hospital. It is therefore important that open discussions are held with the patient and their support person to allow for a risk-benefit analysis to occur regarding the choice of treatment modality, in particular, electrode placement.

2.4 Musculoskeletal risks

Muscle pain may occur, which is thought to be a consequence of the mode of action of the depolarising muscle relaxants, usually suxamenthonium. The initial depolarisation is thought to induce muscle soreness, which generally passes after the first few treatments.

Direct application of the electrical stimulus to the temporalis muscle can cause it to spasm, leading to clenching of the jaw and injury to the tongue or teeth, without adequate muscle relaxant, and use of a mouthguard.

Headaches are commonly reported and generally conservatively managed with analgesia.

2.5 Other patient factors which may increase risk

2.5.1 Poor dentition

A loose or corroded tooth may break during the ECT stimulus due to temporalis muscle spasm and jaw clenching, and could possibly be inhaled. A pre ECT dental review, and the use of a mouthguard and jaw support during treatment help avoid this.

2.5.2 Obesity

Obesity can increase the risk of oesophageal reflux and airway complications during a general anaesthetic and may require modification of pre-treatment preparation and procedural management.

Patients who have had a gastric band may benefit from consultation with a bariatric surgeon prior to treatment. Unless otherwise advised, deflating the gastric band is recommended.

Use of GLP1-receptor agonists increases the risk of reflux and aspiration, especially for long-acting agents, and consultation with the anaesthetist about the best approach is required. Where these agents are used in the treatment of diabetes, consultation with the relevant treating physician is advised.

2.5.3 Asthma and chronic obstructive pulmonary disease (COPD)

There is an increased risk of hypoxia in patients with asthma and COPD.

2.5.4 Osteoporosis

Osteoporosis increases the risk of fractures if the seizure is not well controlled, emphasising the need for good relaxation.

When it is considered necessary to record a motor seizure accurately, using a cuffed limb technique will ensure that a motor seizure is restricted to the isolated limb only.

2.5.5 Endocrine disorders

ECT can induce a thyroid storm in untreated hyperthyroidism.

ECT can induce a hypertensive crisis in pheochromocytoma.

2.5.6 Retinal detachment and glaucoma

Suxamethonium and seizures can both increase intraocular pressure, which could theoretically be problematic for patients with glaucoma (particularly the narrow angle type) and retinal detachment.

However, there have been no case reports of glaucoma being permanently affected by ECT, or of ECT causing retinal detachment.

2.5.7 Skull defects and titanium plates

While not a barrier to administering ECT, electrodes should not be placed directly over a skull defect or a metal plate over a skull defect, due to the risk of a low impedance pathway to the underlying brain. Options may include bifrontal and left unilateral electrode placements.

2.5.8 Deep brain stimulators

Patients with deep brain stimulators should not receive ECT due to the risk of electrical current concentration in the brain areas where stimulation leads have been implanted.

2.5.9 Post surgery

The timing of ECT post-surgery depends upon the nature of the surgery, and the potential risks associated with that specific post-surgical state and ECT. Advice from the surgeon needs to inform decision making.

Additional notes

- Risks associated with anaesthesia for ECT are outlined in section 6.8.
- Risks and considerations for special patient groups: older adults, pregnancy and the puerperium, children and adolescents are discussed in section 1.7.

Guideline 3: The ECT Legal Framework

The Mental Health Act 2014

All ECT in Western Australia is governed by the MHA 2014.

It is an offence for a person to perform ECT on another person unless in accordance with ss. 194 to 199.

Penalty: a fine of $15 000 and imprisonment for 2 years.

ECT can only be performed at a mental health service approved under s. 544 for this purpose.

ECT cannot be performed on a child under 14 years of age under any circumstances.

General provisions of the MHA 2014 also apply including decision making capacity and informed consent (Part 5), protection of patient's rights (Part 16), recognition of rights of support persons and families, and the role of the Mental Health Advocacy Service.

3.1 Prescribing ECT

Treatment planning is a collaborative process; the principle of 'no decision about me, without me' is at the heart of high-quality healthcare.

ECT must be prescribed by a psychiatrist or other medical practitioner. The prescribing psychiatrist must ensure that the appropriate consent and approvals comply with the MHA 2014.

Prescribing psychiatrists should have contemporary knowledge of the range of ECT modalities available (including their potential benefits and adverse effects). If necessary, they should seek expert advice from a psychiatrist with current and specific ECT experience, to determine the optimal treatment for the patient.

3.2 Rights of patients

The Australian Charter of Healthcare Rights describes the rights that consumers can expect when receiving health care. These rights apply to all people in all places where health care is provided in Australia, including public and private hospitals, day procedure services, general practice and other community health services.

Central to a person's rights is the ability to make decisions over their bodily integrity, which includes decisions about any treatment being provided to them.

Irrespective of a patient's legal status or capacity to provide valid informed consent the wishes of the person must be considered when making treatment decisions (MHA 2014 ss.8 & 179).

Even though valid informed consent is not necessary for involuntary or mentally impaired accused patients the psychiatrist must still have regard to the patient's wishes and, in ascertaining those wishes, must ensure that the patient is provided with the same explanation of the proposed treatment, is given the same amount of time to consider the matters involved in the provision of treatment and is given the same opportunities to discuss and obtain advice or assistance about the proposed treatment as is required to be given to a person with capacity to consent (MHA 2014 s.180).

Those voluntary patients who have capacity to consent to treatment must provide valid informed consent to any treatment that is being proposed and they retain the right to withdraw consent at any time during treatment (MHA 2014 Part 5). Therefore, it is important for the treating team to ensure that the patient is still consenting before each treatment is delivered.

All children who have reached 14 years of age and are under 18 years of age, and involuntary or mentally impaired accused adult patients have the right to support from a personal support person and a mental health advocate.

Involuntary or mentally impaired accused patient have the right to request a further opinion, either orally or in writing, about the treatment being provided and the psychiatrist must obtain this as soon as is practicable (MHA 2014 s.182).

3.3 Rights of families and support persons

Support person's rights are recognised in the *Carers Recognition Act (2004)* and the MHA 2014 Part 17. A patient's family and/or support persons are integral to their life and therefore also to the care planning process. They must be given the opportunity to take part in decisions about care wherever possible, and where appropriate consent is in place. The MHA 2014 requires clinical staff to consider both their statutory obligation to maintain patient confidentiality under MHA 2014 s.576, and the statutory right of support persons and family members to be provided with confidential information and be involved in the patient's care.

To assist with this process the MHA 2014 provides a statutory framework for the rights of family members and support persons to be provided with information that is considered personal and confidential about treatment and be involved in care. It also details the circumstances in which they are not entitled to the information or to be involved in care of the person:

- When a voluntary patient has capacity to consent to the release of confidential information to a support person or family member, but does not provide consent, then the support person or family member is not entitled to be provided with that information (MHA 2014 s.286).
- When a voluntary patient does not have capacity to consent to the release of confidential information then a support person or close family member can be provided with that information unless the patient's psychiatrist reasonably believes that it is not in the patient's best interest to do so, in which case they must document those reasons in the medical record and provide a copy to both the patient and the Chief Mental Health Advocate (MHA 2014 ss.287 & 292).

- When an involuntary patient, or a mentally impaired accused, has the capacity to consent to a support person or close family member being provided with confidential information, but the patient does not provide consent, then the support person or close family member is not entitled to be provided with the information if the patient's psychiatrist considers the refusal to be reasonable. (MHA 2014 s. 288).
- When an involuntary patient, or a mentally impaired accused, does not have the capacity to consent to a support person or close family member being provided with confidential information, then the support person or close family member can be provided with the information and be involved unless the patient's psychiatrist reasonably believes that it is not in the patient's best interest to do so, in which case they must document those reasons in the medical record and provide a copy to both the patient and the Chief Mental Health Advocate. (MHA 2014 ss. 289 & 292).

However, whether a patient consents or not to their involvement, support persons are entitled to be provided with general information about treatment, how to access support, and what to expect from mental health services.

3.4 Consent

3.4.1 MHA 2014 requirements for consent for ECT

The MHA 2014 s. 194 to 199 has specific rules about consent to ECT depending on:

- The age of the patient
- Whether they are voluntary or involuntary.

Performing ECT on another person except in accordance with s.194 to 199 is an offence, and carries a potential penalty of $15,000 and imprisonment for 2 years.

3.4.1.1 The voluntary adult patient

With capacity

ECT may be given to voluntary adult patients with capacity if they have given their informed consent.

Informed consent should be obtained for both the ECT and the anaesthetic.

With impaired capacity

An enduring guardian, guardian or "person responsible for the patient" (as defined in s. 110ZD of the *Guardianship and Administration Act 1990*) can provide informed consent to ECT for a voluntary adult patient who lacks capacity.

However, prior to gaining substitute consent, it should also be considered:

- Whether the person meets the criteria to be made involuntary under Part 6 Division 1 of the MHA 2014.
- Whether there is an Advance Health Directive in place.
- Whether supported decision-making approaches could allow the person to make as many decisions as possible for themselves.

3.4.1.2 The involuntary adult patient and Mentally Impaired Accused

ECT may **ONLY** be given to an involuntary patient/mentally impaired accused with the approval of the Mental Health Tribunal (MHT) unless under the emergency ECT provisions within the MHA 2014.

The Mental Health Tribunal can only approve ECT being given at a mental health service approved under s. 544 to provide ECT.

If the Mental Health Tribunal approves a course of ECT the administration of anaesthetic is included as part of the ECT.

3.4.1.3 Emergency ECT

The MHA 2014 s. 199 allows ECT to be given as an emergency procedure to an **adult involuntary** patient/mentally impaired accused:

- To save the patient's life.
- Because there is an imminent risk of the patient behaving in a way that is likely to result in serious injury to the patient or another person.

The treatment can only be given with the approval of the Chief Psychiatrist, or a person to whom the powers have been formally delegated by the Chief Psychiatrist (see Chief Psychiatrist's Schedule of Delegations).

The Chief Psychiatrist or delegate will approve only the number of ECT treatments required to manage the immediate emergency and cover the period until the MHT can be convened.

The approval must be provided BEFORE any treatment is given.

This provision does not apply to children A person under 18 CANNOT be given Emergency ECT treatment under the provisions of s. 199 of the MHA 2014.

This provision does not apply to voluntary patients. Emergency/urgent treatment with ECT CAN ONLY be given to an adult voluntary patient who lacks capacity with a valid Advanced Health Directive or a where a substitute decision maker has consented to treatment.

3.4.1.4 Children: 14 - 17 years old

It is an offence to perform ECT on a child who has not reached 14 years of age.

14 – 17 year old who is a voluntary patient

This requires **informed consent AND the Mental Health Tribunal** to approve treatment. **Informed consent alone is not sufficient to proceed.**

Informed consent

- If the child is not a mature minor, the parents or guardian may provide the consent.
- If the child is a mature minor they can give or refuse consent independently of the view of the parents or guardian. However, it is expected that parents/guardians are involved in all aspects of the process wherever possible.
- Specific legal advice is strongly recommended for complex cases where there is disagreement between child and parent/ guardian.

Approval by The Mental Health Tribunal

- To approve the ECT, the Tribunal must be satisfied that informed consent has been provided.

14 – 17 year old who is an involuntary patient or Mentally Impaired Accused

Only the Mental Health Tribunal can approve ECT treatment.

3.4.2 Provision of information

The MHA 2014 requires that the patient or substitute decision-maker must be:

- Provided with a full explanation of the proposed treatment, and given information about it in a way or format that suits their needs and preferences.
- Given sufficient time to consider the treatment decision.
- Given the opportunity and sufficient time to obtain advice or assistance from anyone they wish to assist with their decision making, eg. advocates, members of the treating team, Aboriginal mental health workers, Elders, other cultural support people etc.

The psychiatrist prescribing the ECT is responsible for ensuring that the patient has been provided with sufficient information, which should include at a minimum:

- Reasons why ECT may be a suitable treatment and how it fits into the overall care plan.
- Alternative treatment options and implications of not having the treatment.
- Details of the treatment (that it involves a course of treatment and at each treatment session a modified seizure is induced under a general anaesthetic).
- Possible adverse events of the ECT- including specific advice about the potential for cognitive impairment to be experienced, which may vary between individuals and may be long lasting and significantly impact the person.
- Possible adverse effects of the anaesthetic.
- What to expect before, during and after the administration of the treatment.

- Any information specific to the person's situation, and responses to questions or concerns the patient and their support persons might have.
- Their healthcare rights and how to escalate concerns or make complaints.

Where a patient lacks the capacity to give informed consent, care should be taken to provide them and their support persons with as much of the information as possible, together with support to understand the treatment proposed and to participate as far as possible in their care

3.4.3 Content and duration of the consent

Standardised consent forms should be used and include:

- Separate consent for the ECT and the anaesthetic.
- The number of ECT treatments.
- Total duration of the course of ECT.
- Position of the treatment electrodes.
- Voluntary or involuntary status including dates of any involuntary treatment order.
- Mental Health Tribunal approval (where relevant).
- Details of the guardian/ substitute decision maker providing the consent (where relevant).
- Signature of third party witness to the consent.
- Patients should be aware that they can withdraw consent at any time.

3.4.4 Duration of the consent

- Consent must be for a specified number of treatments in a course of ECT (maximum 12), as determined prior to commencement to the course of treatment.
- Any additional episodes require a new consent.
- Titration sessions of ECT are counted as one treatment in that course of ECT.
- A course of ECT is complete once a decision is made to stop treatments. A decision to stop treatments is different from the suspension of a course to review progress, and documentation should reflect this difference.
- Once a course has been completed, a new consent must be obtained before a further treatment or another course can begin.
- A new consent should also be obtained if, during a course of treatment, there are substantial changes to the treatment (e.g. electrode placement or wavelength)

3.5 Capacity

The consent process for ECT as described in the MHA 2014 requires an assessment of the patient's capacity to make decisions about ECT treatment.

Capacity should be formally assessed in accordance with the MHA 2014 Part 5, Division 2.

Section 18 in Part 5 Division 2 requires a demonstration that the person can:

- Understand the explanation and information that has been provided about the treatment, any alternative treatments, and any risks involved.
- Understand the matters involved in making a treatment decision.
- Understand the effect of the treatment decision.
- Weigh up the different factors in the treatment decision.
- Communicate the decision in some way.

In law, adults are assumed to have decision making capacity unless shown not to have that capacity. Therefore, if there is any evidence to suggest that capacity may be impaired then an assessment of decision-making capacity must be undertaken and documented.

Children (meaning anyone under the age of 18) are presumed not to have the capacity to make a decision unless they have shown they have that capacity.

A child who is able to demonstrate capacity to decide about a specific matter is known as a 'mature minor', and has the same right to provide or decline consent as an adult. The age when this occurs varies between children, depending on individual maturity. It also varies with the complexity of the decision required; the level of maturity required to consent to a minor procedure such as simple analgesia is lower than that for a significant health intervention such as ECT. In general, the younger the patient is, the less likely it is that they will have the maturity to hold full decision-making capacity, and capacity needs to be carefully and robustly established. This can be a complex area, and clinicians are encouraged to seek advice about the specific situation wherever necessary.

The assessment and conclusions of capacity assessment should be formally documented.

3.6 Supported decision making

Supported decision making is the process of providing people with the assistance and support they need to make their own decisions and remain in control of their lives and choices. It is based on the principle that all adults have an equal right to make decisions that affect their lives, and to have those decisions respected.

The aim of providing support is to enhance a person's capacity to make a decision and minimise the instances where a substitute decision maker is considered. No person should have a substitute decision

maker appointed to make decisions on their behalf if they could make the decision themselves with the right support.

Supported decision making applies to everyone making a decision. The provision of written information in a suitable format, and ensuring that support people have the skills and knowledge they need to help the person, are simple examples of supported decision making.

However, some people may require additional support either all the time, or at various times in their lives, to fully exercise their rights to self-determination and to make and communicate their decision. Services should facilitate this on an individual basis.

The Victorian 'Guidelines for Supported Decision-Making in Mental Health Services' describes the following key enablers of supported decision-making:

- Legal mechanisms including Advance Health Directives.
- Interpersonal skills and relationship building.
- Empowerment of people experiencing mental health challenges.
- Management and leadership.

Other important support methods may include the use of nominated persons, and the use of further psychiatric opinions or advocacy services.

3.7 Substitute decision making and guardianship

Where an adult who is a voluntary patient lacks capacity, informed consent can be obtained from a substitute decision maker, which could be an enduring guardian, a guardian or a person responsible for the adult.

A guardianship order is an order made by the State Administrative Tribunal under the *Guardianship and Administration Act 1990*, that appoints a person as another person's guardian. If there is an appointed guardian, the nature of the guardianship order (e.g. plenary or limited) and authority of the guardian must be established to understand whether it includes treatment decisions. The guardianship order should be sighted.

s.110ZD of the *Guardianship and Administration Act 1990* lays out who can act as a person responsible for an adult who lacks capacity, but does not have an appointed guardian.

The guardian or person responsible should be provided with all the information that would be provided to the patient, to allow them to make an informed decision.

Even though someone may lack capacity, they should be provided with information about ECT and supported in participating as much as possible in decisions about their care.

3.8 Advance Health Directives

An Advance Health Directive is a legal record of a person's decisions, values and preferences about future treatments. It is made when the person has capacity, but used at a time when capacity is lost, to provide or withhold informed consent for a treatment. It has the same status as a treatment decision made by a person with capacity, and can only be overridden in limited, specific circumstances.

An Advance Health Directive must have been completed in line with the *Guardianship and Administration Act 1990* provisions and the clinician should establish the authority of the directive by sighting the Directive and determining that the directive was made when the person had capacity.

3.9 The Mental Health Tribunal

The Mental Health Tribunal (MHT) receives and approves applications for ECT under Part 21 Division 6 of the MHA 2014.

The MHT must approve ECT being performed on:

- A child who has reached 14 years of age but is under 18 years of age and is a voluntary patient.
- A child who has reached 14 years of age but is under 18 years of age and is an involuntary patient or mentally impaired accused.
- An adult who is an involuntary patient or mentally impaired accused.

The patient's psychiatrist must apply in writing for approval to perform ECT, using the form *Application for Approval to Perform Electroconvulsive Therapy.* Electronic forms can be found on the Mental Health Tribunal website, and should be emailed to registry@mht.wa.gov.au.

To approve ECT, the MHT must be satisfied that:

- The mental health service at which it is proposed to perform the ECT is approved under s. 544 for that purpose.
- In the case of a child who has reached 14 years of age but is under 18, and who is a voluntary patient, that informed consent has been provided.

The MHT must also have regard to:

- These Guidelines, specifically 6.8 Anaesthetic Risk.
- Sections 409, s410, s411, s412, s413 Mental Health Act 2014.
- The things listed at section 414(1)(a)-(n) of the Mental Health Act 2014, including:
    - The patient's wishes.
    - The views of a:
        - parent or guardian
        - nominated person
        - carer

        - close family member
    - The reasons why the psychiatrist is recommending electroconvulsive therapy.
    - The consequences for the patient's treatment and care of not performing the electroconvulsive therapy.
    - The nature and degree of any significant risk of performing the electroconvulsive therapy.
    - Whether the electroconvulsive therapy is likely to promote and maintain the health and wellbeing of the patient.
- If the patient is a child, and there is no child and adolescent psychiatrist on the MHT, the views of a medical practitioner or mental health practitioner with relevant qualifications, training or experience.
- The patient's wishes, to the extent that it is practicable to ascertain those wishes.
- If the patient is an adult— the views of any person who is authorised by law to give informed consent on their behalf, and if the patient is a child— the views of the child's parent or guardian.
- The views of any support person, nominated person or close family member if the patient has one.
- The reasons why the psychiatrist is recommending ECT, and the consequences for the treatment and care of the patient of not performing ECT.
- The nature and degree of any significant risk of performing ECT.
- Whether ECT is likely to promote and maintain the health and wellbeing of the patient.
- Whether any alternative treatment is available and the nature and degree of any significant risk of providing the alternative treatment.
- Any other things that the Tribunal considers relevant to making the decision.

The MHT Tribunal may:

- Approve ECT in accordance with the treatment plan set out in the application.
- Approve ECT in accordance with the treatment plan set out in the application but reduce the maximum number of treatments to a number set by the Tribunal.
- Not approve ECT.

See further information at the Mental Health Tribunal website – Applications to approve ECT.

3.10 The Mental Health Advocacy Service

The Mental Health Advocacy Service (MHAS) exists to amplify the voices and protect the rights of people using mental health services.

Part 20 of the MHA 2014 requires the Chief Mental Health Advocate to ensure advocacy services are delivered to the following groups of people, who are called 'identified persons' in the Act:

- People on involuntary treatment orders.
- People referred for psychiatric examination.
- Those subject to custody orders and required to undergo treatment.
- Psychiatric hostel residents.
- Some people who are voluntary patients.

The Act confers considerable powers on Advocates, who may do 'anything necessary or convenient' for the performance of their functions relating to advocacy for individual consumers.

When ECT treatment is being considered, Advocates may be involved in the following ways:

- Representing involuntary patients' wishes where applications to perform ECT have been made to the MHT.
- Ensuring involuntary patients' have been informed of their rights and had their rights observed.
- Requesting a further psychiatric opinion at the request of the involuntary patient.
- Assisting involuntary patients to access legal services if the patient would like legal representation for applications to perform ECT that have been made to the MHT.
- Attending meetings with the treating team to help an involuntary patient express their views about proposed ECT. This may include advocacy in relation to emergency ECT.
- Making any inquiries they consider necessary to assist the patient.
- Investigating and seeking to resolve complaints made by involuntary patients about ECT treatment.

3.11 Nominated persons

A nominated person is another type of support person identified by the MHA 2014. A patient can nominate a person as their nominated person, and they then have a specified role to help the patient make sure that their rights are observed, and their interests and wishes are considered. This includes the right to be given the same information as provided to the patient and support persons. They cannot make treatment decisions on behalf of the patient.

Guideline 4: ECT Service Delivery

ECT may only be administered in Western Australia in services that have been approved by the Chief Psychiatrist under s. 544 of the MHA 2014. A Register of approved ECT suites in WA can be found on the Chief Psychiatrist's website.

ECT must also be provided in accordance with the Chief Psychiatrist's Standards for the Administration of Electroconvulsive Therapy in WA.

The general provisions of the MHA 2014 also apply, as do all Standards published or endorsed by the Chief Psychiatrist under the MHA 2014.

Services should be designed to be safe, effective, accessible, and inclusive for people of all cultures, languages, disabilities, ages, religions, sexualities and gender identities. This should be achieved through partnership with individuals throughout their healthcare journey, and through meaningful codesign of services to make sure that they cater for the communities they serve.

4.1 ECT facility and equipment

ECT may be provided in standalone ECT suites, or within the theatre complex of a general hospital. Whichever location is chosen, ECT facilities should prioritise comfort and privacy, as well as safe medical care.

Separate areas must be provided for waiting, treatment, and recovery. Rooms must be large enough to accommodate the person, staff and equipment safely.

4.1.1 Waiting room

The waiting room should have access to a toilet and change area. It should be a private, comfortable space, with enough room for support person/s to accompany the patient while waiting.

4.1.2 Treatment room

- The treatment room should contain a sink, drainer and scrub-up basin and comply with all healthcare facility specifications for cleaning, disinfecting and sterilising reusable instruments and equipment and maintenance of clinical environments.
- A duress system.
- Contingency plans for the safe evacuation of patients.
- Suitable lighting, airflow, air conditioning.
- Associated support facilities such as phone and computer facilities, storage, toilets and kitchenette.

4.1.3 Anaesthesia requirements

Anaesthetic equipment, resuscitation equipment and emergency medication supplies must meet standards as specified by the Australian and New Zealand College of Anaesthetists (ANZCA) .

Resuscitation equipment must be immediately available. This includes:

- Cardiac defibrillator.
- Difficult airway trolley (with oropharyngeal and nasopharyngeal airways, a range of laryngeal mask airways (LMA) and endotracheal tubes (ETT), intubation equipment (including laryngoscope and videolaryngoscope), airway stylet, airway bougie, front of neck access (FONA) kit. Transfer ventilator and suction.
- Neuromuscular monitoring device (such as NMT).
- Supply of dantrolene in case of malignant hyperthermia/MH kit box with instructions.

4.1.4 ECT equipment

- A modern, brief pulse ECT machine with a wide output range and appropriate accessories including software capability for displaying, printing and uploading data. The ECT machine model must have EEG monitoring (with at least 2 channels of monitoring and a paper print) and be registered with the Therapeutic Drugs Administration. There must be a maintenance program in place, conducted by authorised personnel.
- Treating electrodes patient stimulus cable, +/- hand-held paddles.
- EEG cable, disposable EEG recording electrodes, EEG recording paper.
- Mouthguard.
- Appropriate electrode gel.
- Gauze and agents for cleaning skin (saline scrub followed by alcohol swab and or conduction gel).
- Equipment for pretesting and adjustment of the ECT machine.
- Cardiovascular and other monitoring equipment.

4.1.5 Recovery room

- Patients must not be routinely recovered in the treatment room while another patient is having their ECT.
- Recovery from anaesthesia should take place under appropriate supervision by responsible designated nursing staff as specified by the local area and other governing bodies, in a designated area which conforms to ANZCA standards and guidelines.

4.2 Staffing of ECT services

4.2.1 Minimum staffing requirements

Waiting room: appropriately trained staff under the supervision of a registered nurse

Treatment room: a minimum of 3 staff members:

- A psychiatrist or other medical practitioner credentialed to perform ECT at that facility OR under the supervision of a psychiatrist who is credentialed.
- An anaesthetic doctor.
- A registered nurse with training in ECT, preferably the ECT coordinator.

Recovery room: a registered nurse with suitable training in recovery area care, and annual competency based training in recovery, basic life support and resuscitation procedures. The ration of nurses to patients should be at least 1 nurse to 3 patients, and at least 1 nurse to 1 patient where the patient has not recovered protective reflexes or consciousness (ANZCA).

4.2.2 Leadership

Each facility must have a psychiatrist and a registered nurse with suitable ECT training and experience employed in designated roles as ECT Director and ECT Nurse Coordinator.

4.2.3 Medical staff

Only a psychiatrist or senior medical practitioner with appropriate skills and credentialing can perform ECT without supervision.

Advanced psychiatric trainees may only perform ECT under the supervision of a psychiatrist who is credentialed to provide ECT at that facility.

4.2.3.1 Credentialing

A specialist qualification in psychiatry is not in itself sufficient to deliver the safe and effective administration of ECT.

The purpose of credentialing in ECT is to formally establish the clinician's competence, to provide safe, high quality ECT within a specific facility. Psychiatrists and senior medical practitioners must be specifically credentialed to undertake ECT at a named facility, and cannot do so without this.

The ECT Director for each service must hold an up-to-date record of medical practitioners credentialed to provide ECT in that service.

4.2.3.2 Minimum requirements for initial credentialing of psychiatrists and senior medical practitioners

Attendance at a formal ECT training course for medical practitioners within the last five years.

And

- Supervised training in ECT at the facility from a psychiatrist credentialed in ECT who must confirm in writing to the ECT Director that the medical practitioner is competent to perform ECT without supervision.

Or

- If currently credentialed in ECT at another facility, confirmation in writing from the ECT Director of that service that the medical practitioner is competent in best practice ECT. The ECT Director at the new service should usually arrange for some sessions of supervised ECT to confirm the medical practitioner's competence and familiarise them with the new facility.

4.2.3.3 Maintaining credentialing in ECT

For a medical practitioner to maintain ongoing credentialing in ECT they need to:

- Comply with all ongoing credentialing requirements of the facility/service.
- Maintain currency of ECT practice by delivering a minimum of 10 ECT treatments in each twelve month period.
- Engage in continuing professional development in ECT, for example:
    - Participating in an ECT Peer Review Group
    - Taking part in a service ECT committee
    - Providing second opinions about ECT
    - Attending or presenting at seminars, conferences and workshops on ECT
    - Teaching and/ or supervision of other ECT clinicians
    - Quality improvement activities related to ECT
    - Undertaking research in ECT

4.2.3.4 Psychiatric trainees

Senior psychiatric trainees may perform ECT, but only under the supervision of a psychiatrist who is credentialed to provide ECT at that facility.

The RANZCP Fellowship Program requires all trainees to complete an Entrustable Professional Activity (EPA) in ECT during Stage 2 of their training program.

4.2.4 The ECT Nurse Coordinator

ECT Nurse Coordinators provide a crucial role in ECT service governance and operations. They must have the necessary training and experience to enable them to perform the various roles required in the ECT suite. Sufficient time must be allocated for them to carry out their ECT duties.

The ECT Nurse Coordinator:

- Ensures that they or a delegate are present at each treatment session, except when ECT is given in an emergency
- Ensures that there are sufficient, appropriately skilled nursing staff rostered to manage the complexities of each list
- Ensures that nursing staff working in ECT have appropriate skills and qualifications
- Oversees the patient journey and smooth transition through the service, from initial assessment to discharge, and including assurance that the correct consent is in place
- In conjunction with the Director of ECT, leads safety, quality and risk governance for the ECT service

4.4.4.1 Requirements for ECT Nurse Coordinators

ECT Nurse Coordinators must:

- Be a Registered Nurse (Division 1) with AHPRA, and have Mental Health Nursing experience
- Have attended a formal training course in ECT
- Have attended, and participated in, at least 10 treatments. One of these should be a titration
- Have recent work experience in ECT
- Be aware of the requirements of the MHA 2014, other documents and guidelines framing the delivery of ECT in WA
- Participate in ECT peer review
- Be current in cardiopulmonary resuscitation (CPR) competency

4.2.5 ECT nurses

It is highly desirable that a team of dedicated nurses work in the ECT suite on a regular basis to facilitate consistency and competency in ECT nursing processes. ECT nurses must:

- Be a Registered Nurse (Division 1) with AHPRA.
- Have attended or received training in contemporary evidenced based ECT techniques, including:
    - Clinical indicators for ECT
    - The risks and side effects
    - Dosing schedules, procedural algorithms and stimulus dose protocols

    - Electrode placement
    - Physiological modifications of induced seizures
    - Physiological monitoring during, in recovery and post ECT care
- Have competency and skills in:
    - Setting up for the procedure
    - Induction of the anaesthetic
    - Airway management of an unconscious person
    - Medications used in anaesthesia
    - Recognising deteriorating patient
    - Post anaesthesia recovery
    - Anaesthesia emergencies.
    - Cardiopulmonary resuscitation (CPR).
- Regular attendance at life support and ECT training courses ensures currency of practice, and the ability to problem solve and manage any issues as they arise during treatment.

Role of the ECT nurse

During treatment:

- Assist anaesthetist with intravenous cannulation, application of physiological monitoring and pre oxygenation. Ensure mouthguard is available and used
- Apply EEG monitoring and take 10 second baseline recording
- Implement isolated limb technique
- Assist psychiatrist in impedance test and delivery of stimulus
- Observe the seizure

Between treatments:

- Ensure cleaning of equipment and environment
- Restock equipment

4.3 Safety, quality, and service improvement

Safety, quality and risk management systems for ECT services should be designed to ensure that the service meets:

- The statutory requirements of the Chief Psychiatrist's Standards under the MHA 2014 including:
    - ECT Standards for the Administration of ECT in WA
    - Chief Psychiatrist's Standards for Clinical Care

- All relevant requirements of the National Safety and Quality Health Service (NSQHS) Standards Second Edition 2021
- All relevant organisational policy frameworks

4.3.1 Governance, leadership, and culture

The service has a clear governance structure which includes identification of key personnel (e.g. ECT Director/ ECT Nurse Coordinator) with accountability for safety and quality functions, and a format (e.g. ECT Committee) to formally oversee it.

4.3.2 Patient safety and quality systems

- The service has policies and procedures in place that give clear direction for clinicians, reflect the contents of this guideline and reference other sources of best practice guidance e.g. RANZCP ECT Guidelines and RANZCA Guidelines.
- Each psychiatrist/service prescribing ECT and each service administering ECT should have a formal protocol for monitoring and maintaining records of memory before, during and after a course of ECT.
- Escalation processes are clearly defined.
- The service monitors, reports and reviews its clinical performance across all aspects of the patient journey, and across the multidisciplinary team, including theatres and anaesthetics.
- Areas for reporting and monitoring include:
    - Demographics of consumers accessing the service (including but not limited to age, sex/gender, residential postcode, Aboriginal status)
    - Diagnosis
    - Clinical outcomes
    - Consumer and support person satisfaction.
- Key performance indicators are established and reviewed regularly by the leadership team, with action plans developed to address and monitor areas for improvement.
- Reports are provided to external organisations e.g. monthly reporting of ECT delivered at the service to the OCP as per the MHA 2014.
- The service encourages quality improvement and has systems in place to support quality improvement projects, as part of a continuous quality improvement cycle.
- The service identifies and reports risks and issues, and develops mitigations in response to identified risks.

4.3.2.1 Notifiable and other incidents

Incidents include notifiable incidents as defined by the MHA (see Chief Psychiatrist's website – Reporting Notifiable Incidents – Public Mental Health Services) / Private Hospitals), breaches of the MHA and any other incidents as defined by service policy.

- Processes are in place to report, review and learn from adverse events.
- The service has a designated individual with responsibility for incident management e.g., ECT Director.
- Responsibilities for reporting incidents to other parties (e.g. WA Health and OCP) are met.
- Each incident is robustly reviewed using a standardised methodology.
- Open Disclosure is carried out following an incident, and staff carrying out open disclosure receive training to do so.
- Actions against any recommendations are monitored.

4.3.2.2 Consumer feedback

- The service actively and routinely seeks consumer feedback and evaluation and uses it to improve service delivery.
- The service has a clear pathway for consumer complaints, and proactively offers information to ensure that consumers and support people are aware of the complaint pathways provided by the MHA 2014, which are to the service directly or The Health and Disability Service Complaints Office (HaDSCO).

4.3.3 Clinical performance and effectiveness

- ECT roles have clear position descriptions, responsibilities, reporting lines and accountabilities.
- Systems are in place to ensure that all staff:
    - Are suitably credentialed.
    - Receive orientation to the service.
    - Complete mandatory training requirements as defined by the service.
    - Are up to date with ongoing training and refresher requirements.
    - Can access the training and supervision they need to carry out their roles effectively and safely.
- The organisation has systems in place to monitor variation in ECT practice against expected outcomes, and to address unwarranted clinical variation, including at individual clinician level if required.
- In addition to its use to guide treatment for individuals, deidentified information about cognitive side effects should be used to monitor the performance of the service as a whole, including where possible benchmarking against other comparable services.

4.3.4 Safe environment for the delivery of care

- The organisation has active processes in place to monitor and maintain the facilities and equipment used to provide ECT treatment, including the ability to rapidly respond to concerns as they arise.
- The facilities are designed, wherever possible in partnership with consumers, to provide safe, private, calm, comfortable and welcoming environments for patients and their families (see WA Health 'Working with Consumers and Carers Toolkit').

4.4 Documentation and reporting

The ECT service must ensure that proper records are kept in line with MHA 2014 ss. 200, 201, 204, 410 & 582 and associated standards.

Under section 201 of the MHA 2014 the person in charge of a mental health service where ECT is performed, needs to provide monthly statistics on the use of ECT to the Chief Psychiatrist. The head of service making the report must use the approved form – Form 13 – ECT Statistics.

These statistics must include:

- The number of people in respect of whom a course of ECT therapy at the mental health service was completed or discontinued during the month.

  (MHA s. 201(4) and s. 201(5) states that a course is considered completed during a month if the last treatment in the course was completed in the month, or the decision to discontinue was made during the month.)
- The number of those people who were children.
- The number of those people who were voluntary patients.
- The number of those voluntary patients who were children.
- The number of those people who were involuntary patients.
- The number of those involuntary patients who were children.
- The number of those people who were mentally impaired accused (MIA) under the Criminal Law Act detained at an authorised hospital.
- The number of those MIA who were children.
- The number of treatments with ECT in each of those courses.
- The number of those courses that were courses of Emergency ECT.
- Details of any serious adverse event that occurred, or is suspected of having occurred, during or after any of those courses.

Serious adverse events include:

- Premature consciousness during a treatment.
- Anaesthetic complications (e.g. cardiac arrhythmia) during recovery from a treatment.
- An acute and persistent confused state during recovery from a treatment.
- Muscle tears or vertebral column damage.
- Severe and persistent headaches.
- Persistent memory deficit.

In addition to Form 13, all services must document in the medical record any instance where the Chief Psychiatrist approves the use of emergency ECT, and report to the Chief Psychiatrist the number of emergency ECT approvals authorised and completed in the reported month.

Guideline 5: Preparing the Patient for ECT

5.1 Pre-ECT workup

The purpose of the pre ECT workup is to identify and mitigate any comorbidities and risk factors that may increase the risks of ECT treatment, and to allow the patient, support persons, treating psychiatrist and anaesthetist to weigh up the individual risks and benefits of proceeding, as well as to develop a clearly documented plan to manage any co-morbidities and minimise risks from the procedure.

The workup includes a full medical history and examination, medication review, investigations, anaesthetic and other relevant specialist reviews.

In an emergency situation, the treating psychiatry and anaesthetic team need to ensure that they have been able to carry out enough of a workup to ensure the patient's safe management.

5.1.1 Psychiatric examination

The prescribing psychiatrist must confirm that the patient's condition is one for which ECT is indicated. A further psychiatric opinion should be arranged if requested by the patient.

5.1.2 Medical history and examination

All patients referred for ECT require a thorough medical history and physical examination, focusing on the neurological, cardiovascular and respiratory systems to identify any risk factors that may contraindicate or increase the risk of complications from ECT.

5.1.3 Priority investigations

Table 1: Priority Investigations

Investigation	Comments
ECG (essential)	Can provide essential information about the risk of cardiac arrhythmias that is not always available from the history and examination
Serum electrolytes	Serum potassium should be corrected prior to the commencement of ECT. • Suxamethonium increases serum potassium, particularly in patients with pre-existing muscle damage. If already elevated, dangerously high levels can result, with the risk of a potentially fatal cardiac arrhythmia. • Hypokalemia potentiates the effect of Suxamethonium, possibly causing prolonged apnoea. Dehydration may increase the seizure threshold. Hyponatraemia predisposes to a lowered seizure threshold and increased seizure duration therefore serum sodium should be normalised before ECT if possible.

5.1.4 Other investigations

- Other blood tests (full blood count, fasting glucose, thyroid function) should be performed if clinically indicated.
- Chest X Ray is not routinely required unless clinically indicated.
- Neuroimaging should be considered in patients with abnormal neurological examinations or when there is a clinical indication or concern about an intracranial space-occupying lesion, raised intra-cranial pressure or recent stroke.
- Cervical Spine Xray may be indicated in those with suspected cervical spine instability e.g. in rheumatoid arthritis, severe osteoporosis, Down's syndrome and certain collagen vascular diseases.
- Screening should routinely occur for risk of deep vein thrombosis (DVT), as people with comorbid medical and psychiatric illness often have relevant risk factors. Prophylaxis should be considered as necessary.

5.1.5 Consultations with other specialists

Opinions may need to be sought from other specialists including respiratory, cardiology, ophthalmic and neurology if clinically indicated.

Some medical specialists may be unfamiliar with modern ECT practice and the physiological changes that occur during the stimulus, seizure and recovery period. It is often necessary to provide this information, and carefully frame the clinical question, so the specialist can offer the best informed opinion.

5.1.6 Dental assessment

Evaluation of dentition for the presence of dentures and dental problems that could affect the use of the mouthguard should occur prior to treatment.

Temporal-mandibular joint problems can also be noted.

5.1.7 Anaesthetic assessment

A pre-ECT anaesthetic assessment is mandatory.

Patients should be assessed prior to the start of a treatment course, rather than on the day of the first scheduled ECT, in order to allow adequate time for further investigations and/or consultation.

5.1.8 Baseline and post treatment measurement

The purpose of pre and post ECT measures should be performed to help assess effectiveness and side effects across the domains of cognitive functioning, psychiatric symptomatology and quality of life.

A cognitive examination should be recorded at baseline and after treatment, unless impossible to conduct due to emergency or other factors.

Recommended instruments include:

- Folstein Mini Mental State Examination (MMSE).
- Montreal Cognitive Assessment (MOCA).
- Addenbrooke's Cognitive Examination (ACE-R).
- For people with limited literacy skills or for whom English is not their first language, the Rowland Universal Dementia Assessment Scale (RUDAS) may be useful.
- The Kimberley Indigenous Cognitive Assessment (KICA) was developed and validated in response to the need for a validated cognitive screening tool for older Aboriginal Australians living in rural and remote areas. It has been further adapted for use with Torres Strait Islander people, and for Aboriginal people living in urban and regional areas.
- Routine use of an instrument to rate symptoms before and after a course of ECT is also recommended. Suggested questionnaires include:
    - Montgomery-Asberg Depression Scale (MADRS).
    - Geriatric Depression Scale (GDS).
    - Hamilton Depression Rating Scale (HDRS).
    - Beck Depression Inventory (BDI).
    - Quick Inventory of Depressive Symptomology (QIDS).
    - General psychopathology can be assessed by the Clinical Global Impression Scales (CGI-I, CGI-S) and Brief Psychiatric Rating Scale (BPRS).
    - Any other recognised rating scale relevant to the person's indication for ECT.

In order to gain further information about the impact of ECT on patients' overall wellbeing, a Quality of Life measure is recommended such as the Quality of Life Enjoyment and Satisfaction Questionnaire short form (Q-LES-Q-SF).

5.1.9 Medication review

A careful review of medication by the treating psychiatrist is essential before starting a course of ECT in order to avoid, as far as possible, the use of medications which may interfere with seizure generation or increase risks. In addition, psychotropic medication may need to be altered before and during the course of ECT to reduce the risk of relapse after treatment.

In general, psychotropic medications, lithium carbonate, anticonvulsants, benzodiazepines, diabetic treatments, diuretics and acetylcholinesterase inhibitors need particular consideration.

It is also important to consider stopping antidepressants and mood stabilisers that have not been effective, and planning for alternatives post ECT. In general, psychotropic medications should be minimised as much as possible, and antipsychotic polypharmacy should be avoided.

Nicotine replacement and smoking cessation treatment should be offered to ECT patients.

Patients should be strongly advised not to smoke on the morning of treatment to reduce the risk of anaesthetic complications.

Monitoring of substance use should be considered if it is likely to lead to intoxication during ECT. This may be particularly relevant for outpatients receiving ECT.

Considerations about specific medications can be found in Appendix 1.

5.2 Suitability for outpatient ECT

Not all patients can be safely offered outpatient ECT.

For the treatment to be provided as an outpatient, the ECT practitioner should be confident that the patient is under the continuing care of a psychiatrist who is:

- Reviewing their progress at an appropriate frequency
- Tracking any side effects
- Prescribing their treatment
- Ensuring legal requirements have been complied with
- Regularly liaising with ECT practitioner.

It also needs to be established that the patient is well enough to be safely managed in the community, both in terms of their primary mental illness and any concurrent medical conditions.

The following areas must be explored with the patient and their support person/s, and prior to proceeding there must be an agreement that the patient:

- Will be able to make their way independently to the ECT facility each time before the scheduled time of treatment.
- Will be able to reliably fast for the specified duration before the scheduled time of treatment and administration of the anaesthetic.
- If required, will take essential medication as directed (for example, anti-arrhythmic and antihypertensive medication) at the usual time with only a sip of water.
- Will not drive or do anything else hazardous on the day of treatment.
- Has a suitable person to take them home when fit to leave after treatment, and who can supervise them as advised.
- Knows how to access a clinical service if they have any concerns between treatments, or develop an inter-current illness that could affect the efficacy of ECT and/or the safety of ongoing ECT.

Guideline 6: Anaesthesia

6.1 Anaesthesia standards

The Australian and New Zealand College of Anaesthetists (ANZCA) is the governing body for training and standards of anaesthesia in Australia and New Zealand.

All ECT must be conducted in accordance with ANZCA standards and guidelines.

6.2 Staffing

Anaesthesia must only be administered by medical practitioners with appropriate anaesthetic training or by supervised trainees. All providers must be credentialed to provide ECT anaesthesia by their healthcare facility.

The service providing anaesthesia for ECT must be under the direction of a Consultant Anaesthetist with suitable experience.

During anaesthesia there must be a suitably trained anaesthetic assistant (anaesthetic technician or anaesthetic nurse) present.

6.3 Anaesthesia consultation

Adequate pre-anaesthesia consultation is an important part of patient safety.

It is essential that patients are appropriately selected for the facility in which their procedure is to be performed, taking into consideration their co-morbidities, and the services and support available in that facility.

Each patient must have an anaesthetic consultation and evaluation prior to anaesthesia.

This anaesthesia evaluation must occur before the first ECT treatment. If possible, if should occur prior to the ECT course, and not on the day of treatment, to allow for robust evaluation and any necessary investigations.

Pre-anaesthesia consultations for ECT should comply with the ANZCA Guideline on pre-anaesthesia consultation and patient preparation where the objectives of the consultation are to:

- Ensure that the patient's state of health has been optimised.
- Prepare a plan of perioperative management.
- Allow discussion with the patient and/or guardian.
- Obtain informed consent for the anaesthesia and related procedures.

During maintenance ECT an anaesthetic review should occur if there is a significant change in the patient's medical status.

For each treatment, the anaesthetist must make the final decision whether it is safe to proceed with an anaesthetic.

6.4 Fasting

Fasting is required to minimize gastric residue, but to allow for this while minimizing fluid deprivation, it may be sufficient to fast from solid foods for 6 hours before treatment, and water may be allowed until 2 hours before treatment if the anaesthetist agrees. There may need to be specific consideration for patients who have gastric procedures such as gastric bands, or who are taking GLP1 receptor agonists e.g. Semiglutide (Ozempic). Note Clinical Practice Recommendations on Periprocedral use of GLP1/GIP agonists issued by ANZCA June 2024.

6.5 The anaesthetic

Waiting time before ECT treatment should be minimized to reduce patients' anxiety and distress, and to avoid the need for pre-medication, as benzodiazepines are relatively contraindicated before ECT due to their anticonvulsant effects. Any pre-medication should be individually discussed with the anaesthetist.

The selection of anaesthetic drugs and doses should be individualised to account for each patient's unique requirements. There is little evidence to support therapeutic outcome differences between the various induction agents. The commonly used induction agents for ECT are sodium thiopentone, propofol, methohexital and ketamine.

The drugs used should provide amnesia/unconsciousness throughout the ECT treatment, muscle relaxation during the seizure and ideally have minimal effect on the seizure quality and duration. However, most anaesthetic agents used for general anaesthesia increase the seizure threshold. Therefore, the choice and dose of anaesthetic has an important influence on whether the seizure stimulus produces a therapeutically successful seizure. Muscle relaxants are used to minimise the risk of a skeletal injury during the seizure. Complete paralysis is not necessary, and the dose should be tailored based on the dose used in the patient's previous ECT and their weight. Potential drug interactions of the muscle relaxant with antidepressants (e.g., MAOIs, lithium) must be considered.

Suxamethonium is a commonly used muscle relaxant for ECT due to its short duration of action, but is contraindicated in patients with recent neurological deficit, malignant hyperthermia, hyperkalaemia, burns, atypical pseudocholinesterase, or cholinesterase inhibition. Rocuronium or Vecuronium may be alternatives and have the advantage they can be rapidly reversed with sugammadex following cessation of the seizure.

Due to the significant autonomic changes during ECT, cardiovascular agents should be readily available during the procedure. This includes anticholinergic agents, beta blockers and other intravenous anti-hypertensives.

6.6 Monitoring

Oximetry, non-invasive blood pressure monitoring and capnography are mandatory. At the discretion of the anaesthetist, ECG monitoring is valuable, recognizing the potential for prolonged bradycardia to occur during seizure initiation.

6.7 Recovery

Although rapid transit through recovery areas is seen to be the ideal in terms of operating suite flow, it is important that early or expedited discharge does not impact negatively on patient outcomes. The recovery area provides a place of close, responsive supervision by trained and skilled nursing staff with immediate access to medical care if required.

ANZCA Guidelines should guide post anaesthetic care, and the handover of care from anaesthetist to recovery staff.

The anaesthetist should be readily available to deal with any unexpected problems. For standalone day units where an anaesthetist may not be on site after the treatment period, care should be transferred to a nominated medical practitioner, with the anaesthetist available by phone to provide advice if required.

Post ictal impairment of consciousness may prolong usual recovery times from an anaesthetic. Oxygen and airway support should be provided by recovery staff until the patient has regained consciousness and their observations have returned to baseline. Usual practice includes 5 minute interval recording of blood pressure.

The patient may generally be discharged from the recovery facility (to ward or home) once they meet the criteria outlined in the ANZCA Guideline for the perioperative care of patients selected for day stay procedures: point 7.3 – post-anaesthesia care and discharge arrangements.

6.8 Complications

Management of short-term complications occurring while the patient is in the ECT suite is the responsibility of the anaesthetist. Although most treatment occurs without complication, it is important to be aware of potential issues which may occur.

Anaesthetic related

- Dental injury.
- Awareness.

- Pulmonary aspiration.
- Post anaesthetic nausea and vomiting.
- Peri procedure hypotension requiring the use of vasoactive drugs (metaraminol, ephedrine, Glycopyrrolate).
- Anaphylaxis to anaesthetic agent.
- Prolonged paralysis to Suxamethonium due to pseudocholinesterase deficiency. This may be genetic, or associated with severe malnutrition, liver or renal disease.
- Malignant hyperpyrexia following use of Suxamethonium (dantrolene must be available for this reason).
- Muscle pain following Suxamethonium.

ECT related

- Acute hypertensive event requiring intravenous antihypertensive drugs.
- Post ictal agitation requiring sedative medication.
- Prolonged seizures may need to be terminated by the anaesthetist. Drugs must be available to terminate prolonged seizure (> 90 seconds). These include but not limited to midazolam, thiopentone and phenytoin.
- Status epilepticus may require intubation, liaison with and transfer and to Intensive care facility.

Guideline 7: ECT Treatment Approaches

There are several valid treatment approaches and there is no single protocol for administering ECT. ECT practice continues to evolve and this guideline describes recommended approaches at the time of publication. All ECT services and practitioners need to ensure that their practice remains contemporary and based on current evidence.

ECT can cause retrograde amnesia, and this can sometimes be persistent. The severity and risk of this occurring and persisting is not always possible to predict beforehand, but depends on the ECT treatment approach i.e.. electrode placement, pulse width, dosing, number of treatments and patient risk. These all need to be considered in depth to design an individual treatment plan which balances efficacy and side effect risk. This should occur in partnership with each patient and their support person/s, based on their individual risks, circumstances and preferences.

7.1 ECT electrode placement

There are four types of electrode placement which are used depending on patient circumstances.

7.1.1 Unilateral placement

- This is the preferred initial placement for most people based on acceptable efficacy, and a lower rate of cognitive impairment than bi-temporal placement.
- The unilateral placement most commonly used is right unilateral (RUL) ECT on the basis that it avoids direct simulation of the dominant (left) hemisphere (the vast majority of right-handed people are considered to have left dominance, and a high proportion of left-handed people have either left-sided or bilateral cerebral dominance).
- The correct position is the d'Elia position (Figure 1).
- The d'Elia position directs the current across the motor cortex, the area of the cortex with the lowest seizure threshold. For left unilateral ECT the same positions are used, but on the left side of the head.
- Doses up to six times seizure threshold (6 x seizure threshold) can maximise the efficacy of unilateral ECT.

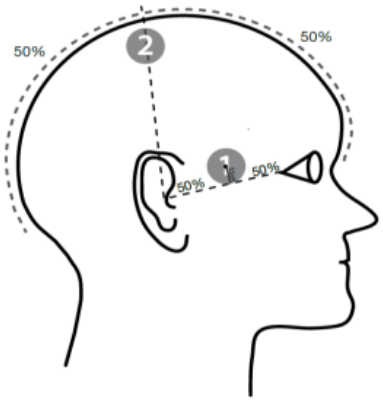

Figure 1: d'Elia

Figure 1: The temporal electrode (flat) is placed over the right temporal fossa, with the centre of the electrode 2.5cm above the midpoint of a line drawn between the tragus and the outer canthus of the eye. The centre of the second electrode (concave) is placed slightly (1cm) to the right of the vertex, which is at the intersection of the line drawn between the nasion and the inion (occipital process), and the line drawn between the tragus of each ear. The vertex is not the crown, which is more posterior.

7.1.2 Bitemporal placement

- Historically, the most widely used bilateral electrode placement was bitemporal. Electrodes are placed over both temples bilaterally (Figure 2).

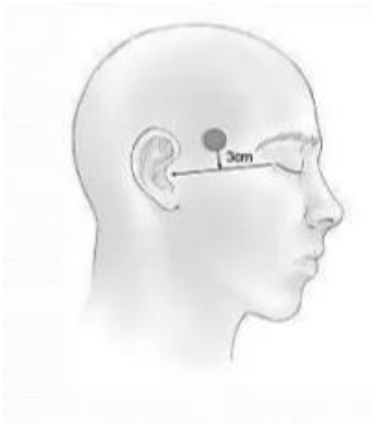

Figure 2: Bitemporal

- Generally, bitemporal ECT has been thought to be more effective than unilateral ECT, but cognitive side effects are significantly greater, and it can cause retrograde amnesia that can be severe and/or persistent and even permanent. The severity and risk of this occurring and persisting depends on dosing level, number of treatments, and patient risk factors and cannot always be predicted before treatment.
- It should therefore only be used where there are compelling reasons to seek a rapid or emergency treatment response, or other approaches have previously failed. If bitemporal ECT is contemplated, the psychiatrist should carefully document why it has been considered for this patient. A second opinion from a psychiatrist with ECT expertise is also recommended.

- If bitemporal ECT is used, close monitoring of side effects is essential throughout the treatment course to inform decision making.
- Doses of at 1.5 times seizure threshold (1.5x seizure threshold) are usually sufficient for efficacy.

7.1.3 Bifrontal placement

- The use of bifrontal ECT (Figure 3) is increasing internationally and it is argued to have good therapeutic potential and a desirable side-effect profile compared with bitemporal ECT.

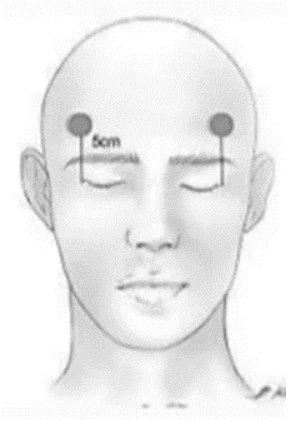

Figure 3: Bifrontal

- It has also been shown to have less impact on cardiac rhythm (during the stimulus) than other forms of ECT. Bifrontal ECT therefore should be considered when treating patients at risk of arrhythmias.
- If using bifrontal ECT, accurate placement of the electrodes is important to ensure appropriate stimulus delivery.

7.1.4 Left anterior right temporal placement (LART)

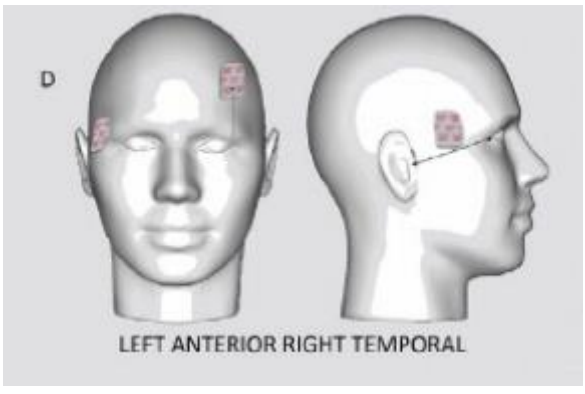

Figure 4: LART

- The rationale for the Left Anterior Right Temporal (LART) position (Figure 4) is that the electrode placement is near the medial region of the frontal lobes, which is thought to be

the cortical region that is most sensitive to seizure induction by electricity and more efficient in transmitting current.

7.2 Pulse width

The ECT device in use should allow for the electrical stimulus to be delivered at varying pulse widths. The device may allow the operator to set the individual treatment parameters (e.g. some Mecta models), or the parameters may be pre-programmed (e.g. Thymatron).

Brief pulse width

- Traditionally ECT has been given with a brief pulse width, defined as pulses of 0.5-2.0 ms duration.
- The most frequently recommended pulse width for all electrode placements is 1.0 ms (i.e. within the brief range), and most published efficacy studies have used the 1.0 ms pulse width.
- A 0.5 ms pulse width i.e. at the lower end of the brief range is also now being used in Australia and internationally.

Ultrabrief pulse width

- More recent studies have examined **ultrabrief** pulse widths of 0.25-0.3 ms.
- Studies have demonstrated that for unilateral ECT, cognitive impairment is significantly reduced when using ultrabrief compared to 1.0 ms pulse widths.
- However, efficacy outcomes are less consistent between studies, with most studies finding a slower speed of response for right unilateral ultrabrief. A meta-analysis in 2015 showed that efficacy (in terms of remission rates and speed of response) is lower in right unilateral ultrabrief ECT, although with significantly reduced cognitive side effects.
- This means that while ultrabrief right unilateral ECT causes fewer cognitive effects, using this approach may require more treatments over a longer period. If it does not lead to a significant clinical improvement, there may be a need to switch to an alternative form of ECT.
- Ultrabrief pulse width bitemporal and bifrontal ECT should not be used routinely because studies to date have not shown sufficient efficacy to recommend it.

Broadly speaking, lowering the pulse width is associated with a reduction in efficacy. This should be taken into account when determining the dose relative to seizure threshold: generally higher doses relative to seizure threshold are required when reducing the pulse width, to achieve similar efficacy (see table 2).

A titration procedure is necessary to enable accurate calculation of the supra-threshold dose. It is necessary to ensure that the ECT device can deliver small stimulus dose increments in the low dose range.

7.3 Seizure threshold and initial treatment dose

For ECT to be effective, it is necessary to induce a generalised tonic clinic seizure. However, a seizure alone is not sufficient for therapeutic effect.

The seizure threshold is defined as the lowest electrical dose (stimulus) which elicits any seizure activity, as seen on the EEG and/or visible motor movement.

Stimulation at this level or just above (1.5 x seizure threshold) has been shown to be effective for bilateral electrode placements, and may also apply to left anterior right temporal placement.

However, in unilateral ECT, a stimulus delivered barely above seizure threshold may create a tonic clonic seizure but have little effect on improving target symptoms (e.g., depression). A stimulus that is markedly above the seizure threshold improves symptomatology, but also carries with it the risk of significant cognitive side effects. Studies have suggested that dosing at 5-6 x the seizure threshold is required for efficacy over a course of right unilateral ECT.

Alternative dosing methods have been proposed. In fixed dose regimens, treatment is delivered at a set electrical charge (e.g. at 350mC). But seizure threshold varies from patient to patient. If all patients, regardless of age, gender, diagnosis, medications, or number of previous ECT treatments, received the same dose, with the same electrode placement, some patients (for example, those with high seizure thresholds) could receive sub-optimal treatments. Others with low seizure thresholds could be left with excessive cognitive effects.

Another dosing method is to use "age-based" methods (age and half-age) in which the treatment is delivered at the percentage of the maximum charge (500mC) similar to the patient's age for unilateral treatment (for 1msec pulse width), and half the patient's age for bilateral treatment. This method presumes the patient's seizure threshold is about average. Of course, this method will also undertreat those with high seizure thresholds, and treat at high multiples of the seizure threshold for those with a low threshold. This method might be used in cases where it is best that the titration method is not applied (for example where the severity of illness requires the immediate effect of ECT).

It is therefore best to establish/reestablish the seizure threshold for each individual at the beginning of each course of treatment and empirical dose titration (also known as stimulus dose titration) is the recommended approach.

7.3.1 Measuring the seizure threshold

Titration Method

- The titration method involves stimulating a patient with a gradually increasing stimulus dose, starting at a low dose, to determine the threshold for an induced seizure. The dose increases are delivered until an adequate seizure is obtained.
- There is varying opinion about whether the seizure threshold is the charge at which any seizure activity occurs (most widely used), or at which "adequate" seizure activity is seen.

- Adequacy of the seizure is determined via EEG morphology from the EEG readout delivered by the ECT machine. An adequate EEG morphology will show a clear progression from recruitment phase to a high amplitude delta or theta discharge, which then slows over the course of the seizure. It is preferable that there should also be evidence of spike and wave activity during the recording, for evidence that a seizure has been achieved.
- Once the seizure threshold is known, subsequent settings (the initial treatment stimulus dose) are recommended in the tables below.
- After the initial treatment, the stimulus dose for subsequent treatments is either maintained or gradually increased, using EEG criteria as well as clinical response as a guide (See Guideline 9 – Monitoring during treatment).
- Various protocols are available for the titration method dose scheduling.

Recommendations for Clinical Practice

Once the seizure threshold is determined, the RANZCP recommends approaches that demonstrate the balance of efficacy against side-effects are as follows:

Table 2: Recommended parameters for pulse width and seizure thresholds

Electrode Placement	Recommended parameters for pulse width and seizure threshold
Right unilateral	Ultrabrief pulse width (0.3ms) at 6 x seizure threshold Brief pulse width (1.0ms) at 5– 6 x seizure threshold* Brief pulse width (0.5ms) at 5–6 x seizure threshold, noting lower level of evidence
Bitemporal	Brief pulse width (1.0ms) at 1.5 x seizure threshold Brief pulse width (0.5ms) at 1.5-2.5 x seizure threshold
Bifrontal	Brief pulse width (1.0ms) at 1.5 x seizure threshold Brief pulse width (0.5ms) at 1.5-2.5 x seizure threshold
LART	Brief pulse width (1.0ms) at 1.5 x seizure threshold Brief pulse width (0.5ms) at 1.5-2.5 x seizure threshold

* Lower dose levels (3 x threshold) have been shown to have lower, but still clinically meaningful efficacy

Careful consideration is needed when considering combinations of electrode placement, pulse width and dosing combinations other than those above. Limited evidence on bifrontal and bitemporal ultrabrief ECT suggest lower efficacy than brief pulse bifrontal and bitemporal ECT. If the psychiatrist is in doubt, they should discuss the treatment with a psychiatrist who has more ECT experience.

7.4 Frequency and number of treatments

- It is conventional practice to do 2 or 3 ECT treatments per week, administered on non-consecutive days.
- The literature on the relative benefit of twice versus three times weekly treatments suggests that the total number of treatments required is fewer with twice weekly ECT, but that the duration of the treatment course may be slightly longer.
- Twice weekly is probably the optimal balance between efficacy and side effects for bitemporal ECT, but few studies have compared these schedules for other placements.
- Slowing ECT frequency to twice weekly may be beneficial for patients who are particularly susceptible to cognitive side effects e.g. those with pre-existing cognitive impairment, or where significant cognitive impairment or a rapidly rising seizure threshold becomes evident during the treatment course.
- For patients with rare severe and life-threatening clinical states e.g. malignant catatonia, more frequent e.g. daily ECT treatments may be used initially to achieve a rapid response, and then the spacing increased to 2 or 3 treatments per week.
- However, if ultrabrief and brief unilateral electrode placements are used, more treatment episodes are required to achieve a response or remission.
- Multiple ECT (the delivery of more than one adequate seizure per treatment session) is not supported by evidence and is not recommended.
- Where patients show improvement with their ECT treatments, the treatment should be ended or tapered as soon as it is evident that a maximum response has been attained.

7.5 ECT administration in pregnancy

Screening and selection of pregnant patients by a multidisciplinary team, including a specialist psychiatrist in ECT, a psychiatrist with expertise in perinatal psychiatry, and an obstetrician is essential.

Anaesthetic management of the patient will depend on the trimester of pregnancy and may (especially in the third trimester) include left lateral or pelvic wedge tilt (to avoid compression of the IVC and to maximise foetal blood flow), adequate pre-oxygenation, avoidance of hyperventilation (as this potential reduces foetal oxygenation), premedication with an antacid or H2 blocker and intubation (to reduce the risk of reflux and aspiration).

Any ECT induced maternal hypertension must be managed.

Close monitoring of mother and foetus is required before, during and after ECT, including consideration of foetal heart rate monitoring with Doppler from 14-25 weeks, or cardiotocography (CTG) from 26 weeks gestation.

ECT after 20 weeks gestation should only ever be carried out in tertiary hospitals with obstetrics on hand.

7.6 ECT administration for children 14 - 17 years old

ECT administration in young persons is generally similar to that in adults. There is little evidence on the optimal method of administration in adolescents, but the following points should be noted:

- A specialist child and adolescent psychiatrist should always conduct an assessment of the patient for proposed ECT as part of the comprehensive psychiatric assessment.
- All patients require a comprehensive medical assessment. There are no absolute medical contraindications to ECT in young people, but there are the same medical contraindications as for adults)
- The need for concurrent medication during the ECT course should be ascertained on a case-by-case basis.
- The seizure threshold for adolescents is often lower than that in adults.
- The site of electrode placement and frequency of ECT treatment are as for adults.
- The number of treatments usually required (6-12) is similar to that required by adults. The total number should be based on treatment response rather than a pre-determined plan.
- Improvement and side-effects should be monitored by regular clinical assessment, patient self-report, collateral observations from family and support persons and weekly use of subjective and objective symptom rating scales.
- Monitoring should also include ongoing assessment of academic performance.
- Adolescents may require medication and/ or psychological interventions following the ECT treatment course, in order to maintain improvement and prevent relapse.
- Maintenance ECT may occasionally be considered when the initial improvement is not sustained despite other measures. Its role should be carefully considered by the treating psychiatrist/team and discussed thoroughly with the patient and family or support person before implementing this approach in adolescents.

Guideline 8: ECT Administration

8.1 Preparation

It is important that careful planning occurs with the patient and their support person/s so that it is clear how they will travel to the ECT suite, how they will travel back to the inpatient unit or home address if an outpatient, and how to access help and advice if they have any concerns after the treatment about adverse events or other matters.

Prior to the day of treatment, patients and their support person/s should have a good understanding of how the day will run and what to expect at every step,

Specific advice should include:

- Eating and drinking before the treatment.
- Hair preparation.
- How communication aids and personal items such as glasses, hearing aids, contact lenses and jewellery will be managed.
- Voiding of bladder and bowels prior to treatment.
- Medication to be taken or omitted prior to treatment:
    - Oral medications may be given at their usual time up to one hour prior to each treatment with a sip of water. Bronchodilators, eye drops and topical medications should be administered as usual and not be withheld prior to treatment.
    - Diuretics should usually be avoided on the morning of ECT to avoid post-ictal urinary incontinence.

The ECT Nurse should also:

- Complete a comprehensive nursing assessment for each patient.
- Check that the patient advice has been received, answer any queries and ensure each patient understands fasting requirements.
- Prepare the ECT list prioritising patients according to medical and mental health needs.

8.2 Patient identification and procedure matching

Correct patient and procedure identification are essential to safe healthcare. Therefore, there need to be standardised checks and recording of:

- 3 points of ID
- Consent:
    - Confirmation that the consent form has been sighted, is signed and is current.

- If patient is self-consenting, verbal confirmation of consent.
- Confirmation of legal status and MHA forms if in place.
- Confirmation of approval by the MH Tribunal if involuntary or a child.

8.3 Pre ECT checklist

Each service should have a standardised Pre ECT checklist which is checked and signed by the ECT Nurse.

In addition to the patient identification and consent, the checklist may include:

- Fasting status
- Bladder status: last time voided
- Baseline vital signs
- Baseline weight
- Pressure area risk score
- Blood sugar if diabetic
- Medication given
- Hair and skin preparation
- Personal items labelled and stored.

8.4 During the procedure

The ECT practitioner should greet the patient, introduce other clinicians and explain the process that is underway. Any procedures which occur prior to anaesthesia should be carefully explained to the patient as they are performed.

8.4.1 Electrical contact: impedance and skin preparation

- Impedance is a measure of the opposition to electrical flow and should be measured (some ECT machines do this automatically, others require it to be done manually).
- Careful skin preparation improves conductivity and reduces impedance, and can therefore minimise the dose required.
- Variation in skin preparation can cause changes in EEG morphology between treatments and patients. Each service should therefore have protocols for their preferred skin preparation practice, so that it is carried out consistently.
- Inadequate cleansing or sloppy use of conductant gel can result in an inadequate or aborted seizure and in skin burns.

Standardised protocols for skin preparation at the electrode site may include:

- Patients requested to shampoo their hair the night before and rinse well to remove all shampoo from scalp and hair.
- The chosen electrode sites are thoroughly cleansed with saline or alcohol-soaked gauze squares to remove oil, makeup, gel from previous treatments, hair sprays, dead skin cells etc. If self-adherent electrodes are used, saline should be used for skin preparation rather than alcohol.
- In elderly patients, skin integrity must be considered, and alcohol-soaked gauze or a gel which may be abrasive should not be used.
- A conductive ECT gel (non-abrasive) should be applied onto the electrode surfaces.
- The electrodes should be firmly pressed against the skull to minimise impedance.

8.4.2 Protecting the teeth

As the temporalis muscle is directly stimulated by the passage of current in both bilateral and unilateral electrode applications, there is a risk of jaw clench and resulting dental damage, which is not adequately managed by the muscle relaxant alone. An effective mouthguard will distribute the load across the posterior teeth, which are more able to withstand the force. Supporting the chin ensures that the teeth are correctly positioned as the stimulus is applied.

8.4.3 Isolated limb technique

The isolated limb technique (cuff method) is useful in monitoring for awareness as well as to monitor the seizure (see Guideline 9 – Monitoring during treatment).

The distal portion of a limb is blocked from receiving muscle relaxant by inflating a blood pressure cuff to a pressure above the systolic pressure. This means that the motor component of the seizure can be seen in the distal limb beyond the cuff, which is unaffected by the muscle relaxant. The cuff is usually inflated above the ankle.

If using the isolated limb technique to monitor motor seizure, the cuff should be inflated to 40% above systolic blood pressure after the anaesthetic induction agent has been given, and just prior to the administration of the muscle relaxant.

8.4.4 Team Time Outs

8.4.4.1 Pre-anaesthetic time out

As a crucial safety measure, a time out procedure must be conducted before the anaesthetic to check and ensure:

- Correct patient
- Correct consent
- Correct electrode placement
- Correct pulse width
- Correct dose
- Correct anaesthetic drugs and doses

The Team Time Out must be conducted jointly and simultaneously by the ECT practitioner, the ECT nurse and the anaesthetist, who must not be carrying out any other tasks at the same time. All non-essential communication should be ceased during the Team Time Out.

Everyone in the team must agree that each item is correct before moving onto the next check.

Any anticipated procedural or clinical difficulties which may affect the plan should also be briefly discussed so that their management is agreed by all.

The Team Time Out must be documented.

8.4.4.2 Post-anaesthetic, pre-treatment time out

This is a very brief time out to ensure the prevention of unmodified ECT. The anaesthetist must verbally and clearly state "anaesthetic delivered, ECT can proceed". The ECT operator must say "ECT will be given/delivered now".

8.4.5 ECT administration

Once the anaesthetic is administered:

- Attach the recording and treating electrodes if not already in place.
- Test ECG equipment.
- Perform baseline measurements on EEG (Thymatron).
- Insert the mouthguard (anaesthetist).
- Check impedance: This may be done automatically (for example, MECTA devices) or manually (Thymatron). The static impedance level should be below the machine's maximum limit (MECTA 5000 ohms, Thymatron 3000 ohms).

  If it is too high the following steps are required:

- Ensure that the treatment cable is connected to the treatment electrodes and to the ECT device.
- Ensure that the electrodes are firmly against the skin and that there is sufficient conductive gel – add more gel if needed.
- If using disposable adhesive electrodes, a small amount of conductive solution may need to be placed in the centre of the electrode which is then replaced and held firmly with a 'dummy' electrode if necessary.
    - MECTA device: If the impedance cannot be reduced below the machine's maximum limit, the machine will not discharge and treatment cannot proceed.
    - Thymatron device: If using the Thymatron device, treatment can safely proceed but by Ohm's Law, the dose delivered will be less than the dose required, as the voltage increase needed to overcome the high impedance is capped for safety reasons.
- It should be noted that at very high doses, when the impedance is above 1500 ohms, the dose may not be delivered in full. The actual dose delivered can be seen on the printout of the trace.

- Confirm with the anaesthetist that the patient is fully anaesthetised, and that adequate muscle relaxation has been achieved and that the mouthguard has been inserted.
- Apply the ECT stimulus by lifting the safety guard and pressing the treatment button until the discharge is complete.

8.5 Monitoring during treatment

8.5.1 Monitoring during anaesthesia

Monitoring during anaesthesia should comply with the ANZCA Guideline for monitoring during anaesthesia.

ECT affects the cardiovascular system. With the initial parasympathetic outflow from the stimulus and then sympathetic outpouring that results from the seizure itself, brief but significant falls and rises in blood pressure and heart rate occur.

Continuous ECG monitoring as well as repeated blood pressures and oximetry before, during, and after the procedure is mandatory.

Additional monitoring may be required for specific medical conditions.

8.5.2 Monitoring the seizure

The aim of monitoring the seizure during treatment is to determine that a seizure has actually occurred, the seizure is generalised to both hemispheres, and is of adequate intensity to bring about symptom recovery.

To do this, both EEG monitoring and monitoring of the motor component of the seizure are used. It is important to use both methods because each method has limitations if used alone.

8.5.2.1 EEG monitoring

- Preferred EEG recording sites for both unilateral and bilateral ECT are left and right para-sagittal sites, and mastoid sites. These sites give the clearest recordings of characteristic EEG evidence of seizure activity, despite the significant differences in propagation of seizures between individuals, and between unilateral and bilateral treatments.
- To record EEG activity the recording site needs to be clean and dry.
- It was previously believed that seizure length in ECT reflected seizure adequacy. It is now clear that seizure time is less important than other aspects of the seizure. Although many factors can affect seizure expression, current evidence suggests that higher amplitude spike and wave activity and sharp post-ictal suppression are the most important aspects to review.

8.5.2.2 Motor activity monitoring

The motor component of a seizure can be monitored by visual observation, or by using the isolated limb technique (see Guideline 8.4.3).

For unilateral ECT, the cuff should be placed on the same side as the electrodes to ensure generalisation.

The cuff is placed before the administration of the muscle relaxant. It should be deflated immediately following the seizure to avoid ischemia.

- This method may be particularly useful with stimulus titration, assisting in the determination of seizure threshold.
- Benefits of this method are that it can provide evidence of a generalised seizure in the event of a faulty EEG, and it also provides a means by which patients can indicate awareness after induction.

Limitations of the isolated limb technique:

- Tonic/clonic seizure activity stops before seizure activity ceases in the brain, i.e., motor component timing is not useful in measuring the total seizure time, because it may over or underestimate central nervous system seizure activity.
- This technique is not appropriate for patients with skin or some musculoskeletal diseases such as severe osteoporosis, deep vein thrombosis and sickle cell disease.

- There is disagreement whether motor activity across all sites should be included as evidence for central seizure activity.

8.5.3 Missed or inadequate seizures

- After a stimulus in ECT, it is possible that no seizure is elicited i.e. there is a missed seizure.
- At times a brief response (less than 10 seconds) results, or the morphology is judged to be poor; this is termed an inadequate seizure.
- Most patients will not experience clinical benefit from a seizure of this short duration, although some people do appear to undergo brief seizures with nevertheless clear and progressive recovery.
- Older patients are more likely to have poorer quality seizures, without this necessarily meaning a lack of response to treatment.
- Possible causes of missed or inadequate seizures are:
    - Insufficient stimulus
    - Excessive impedance from poor skin contact
    - Poor contact of leads
    - Movement artefacts
    - Variation of anaesthetic technique
    - Hypercarbia from inadequate ventilation
    - Hypoxia
    - Dehydration
    - Medications (typically benzodiazepines and anticonvulsants).
- A session that concludes with missed or inadequate procedures is still considered a treatment episode.

8.5.3.1 Possible remedies for missed or inadequate seizures

Immediate approaches include the following:

- Review the 'dynamic impedance' reading elicited by the ECT device. If it is too high, review the skin preparation, gel application, and/or electrode positioning.
- Consider restimulation at a higher dose if anaesthetic risk allows:
    - Restimulate at 50% above the original dose.
    - If the seizure is still inadequate, another stimulus under the same anaesthetic may be considered at a higher dose, after another 30 to 45 second time lapse, if no additional anaesthetic and muscle relaxant needs to be given.
    - Apart from during stimulus titration, no more than 3 stimuli per patient should be delivered during an ECT treatment session due to the risk of side effects including

significant brady arrhythmias and post-ECT confusion. Memory deficits also increase with the number of sub-convulsive stimuli.

If a patient has repeated missed seizures or persistently poor-quality EEG recordings despite adequate dose increases:

- Review hydration and electrolyte balance.
- If possible, reduce or discontinue medications that may hinder the ECT. Consider the possibility of the unrecognised use of medications with anticonvulsant properties, particularly benzodiazepines.
- Consider employing measures to enhance seizure production, such as hyperventilation changing the type or dose of the anaesthetic agent and increasing the time interval between the start of the anaesthesia and start of the ECT stimulus.
- Consider augmenting the anaesthetic with remifentanil or ketamine which may allow further reduction of the dose of the main anaesthetic induction agent. The use of augmentation strategies such as theophylline or caffeine is not recommended because of the medical risk.
- Consider using ultrabrief pulse width right unilateral ECT which is more efficient at producing seizures.
- Acknowledge that poorer quality EEGs may occur but the treatment still be effective.

8.5.4 Prolonged seizures

- Prolonged seizures may occur with ECT. By convention, the cut off for seizure activity is considered to be 120 seconds .
- Seizures lasting longer than 120 seconds on EEG criteria should be terminated. Possible remedies are to abort the seizure with an anticonvulsant agent such as midazolam, thiopentone or propofol and/or to intubate if necessary.
- The anaesthetist should be alerted after 90 seconds to prepare for possible intervention.
- Prolonged seizures may lack a motor component (sub-convulsive status); this is one of the most compelling arguments in favour of EEG monitoring in ECT.
- Each unit should have clear protocols about how to manage prolonged seizures.

8.6 Completion of treatment

At the completion of treatment, the machine should be turned off to ensure the charge is reset before the next treatment commences.

8.7 Post ECT Care

Immediately post ECT

The patient should have access to their belongings as soon as the treatment is completed.

Recovery

The patient should be transferred to an appropriately equipped recovery room when they are spontaneously breathing and rousable. They should remain in Recovery at least until they are alert and orientated, and their observations are within their own pre ECT range.

A recovery nurse (RN trained in recovery techniques) should be present at all times to:

- Receive ISOBAR handover from the anaesthetist.
- Assess level of consciousness, gag reflex and airway patency.
- Administer oxygen and suction secretions if required.
- Monitor vital signs as per local protocol, minimum 15 minutely.
- Assess and evaluate APGAR score e.g. activity, respiration, circulation, neurological status and colour.
- Observe for restlessness, confusion or postictal agitation.
- Report abnormalities to anaesthetist.
- Offer pain relief and observe for nausea.
- Remove IV access.
- Document all care.
- Organize onward transfer.

Limitations following treatment

Persons receiving ECT should be advised, for a minimum of 24 hours after receiving ECT, not to:

- Drive a vehicle
- Operate machinery
- Sign any legal documents
- Make financial decisions or
- Have sole responsibility for children.

Guideline 9: Monitoring Between Treatments

During an acute course of ECT, prescribing psychiatrists should review patients at least weekly between treatments and monitor progress with the patient, their support persons, and the psychiatrist and team administering the ECT. A formal review must also occur at the end of a course of ECT.

This monitoring should include assessment of:

- Efficacy/response to ECT
- Cognitive functioning
- Non-cognitive adverse effects
- Routine monitoring of EEG quality.

The ECT service should have policies and procedures in place to ensure that this monitoring occurs.

All patient concerns must be carefully addressed and may require discussion of whether to continue with further treatment.

Any sudden onset of new risk factors or worsening of risk factors identified pre-ECT must be evaluated before the next ECT treatment.

The total number and frequency of ECT treatments required by a patient should be guided by their response to the treatment, balanced against any cognitive or other adverse effects.

9.1 Assessing patient response to treatment

Wherever possible standardised ratings scales should be used to allow tracking of response over a course of treatment. See section 5.1.8 – Baseline and post treatment measurement for more details.

9.2 Lack of response to ECT

Patients should not be considered non-responders to ECT until they have had a sufficient number of treatments, and attempts have been made to optimise ECT response.

There is a lack of evidence base to guide treatment choices where someone has not responded to ECT, but consensus approaches are described below.

If there is no clinical response after 4-6 treatments, the indication for continued ECT should be reassessed.

If the decision is to continue with ECT treatment, possible approaches to optimise ECT technique include:

- Increasing the stimulus intensity
- Changing from unilateral to bilateral electrode placement:

  - If unilateral treatment was commenced, consider switching from brief pulse unilateral to brief pulse bifrontal or bitemporal ECT (or LART) if there is no improvement after 4-6 treatments, although for some patients switching after four treatments may be premature as discernible improvement may not occur before treatment number six.
  - Consider switching from ultrabrief right unilateral to brief pulse right unilateral, bifrontal or bitemporal ECT (or LART) if there is no improvement after 6-8 treatments.
  - Switching earlier may be appropriate if clinical response dictates (e.g. if a person is catatonic).
  - Re-titration is recommended as seizure threshold will be different when a different form of ECT is used.
- Reducing or removing medication that may decrease response (e.g., benzodiazepines, and anticonvulsants).
- Considering a change in anaesthetic technique.

Prior to ceasing ECT due to non-response, it is advisable to seek further advice from experts in the management of the underlying disorder or with significant experience in ECT delivery.

9.3 Stimulus dose changes during treatment course

- ECT treatments increase the seizure threshold, and this anticonvulsant effect is progressive and cumulative during a treatment course.
- To continue to achieve a moderate supra-threshold stimulus over a course of ECT it may be necessary to increase the stimulus dose.
- As the threshold rises, continuing the same dose means that the treatment is occurring at a lower dose relative to threshold, and the EEG quality deteriorates. This is the signal to increase the dose.
- A psychiatrist experienced in ECT should examine the previous EEG tracings in order to detect changes in the quality and to therefore adjust the dose. This could either be done prior to each treatment or after a treatment, taking into context all factors in order to recommend the next dose level.
- The decision to increase the dose or re-titrate may also be based on an assessment of the patient's clinical progress, independent of or in conjunction with the EEG morphology.
- It may be necessary to consider re-titrating during a treatment course. Some ECT services do so routinely after a set number of treatments (e.g. 6). It is recommended to re-titrate if the charge needed to induce a seizure of adequate morphology has risen to well above the initial treatment charge, assuming this was set at the relevant multiple above seizure threshold.
- It may also be appropriate to re-titrate if the seizure threshold escalates quickly at any stage in an ECT course.

- The decision to increase the dose or re-titrate is based on changes in the quality of the EEG during the course. It is recommended that the stimulus dose is increased where unexpected difficulty is encountered in achieving adequate seizure activity (assuming impedance has not increased dramatically, and the same care is applied to ECT stimulus delivery).

9.4 Assessment of memory function

The presence and severity of changes in memory must be carefully monitored during a course of ECT.

- Formal testing should be done at least at baseline and at the completion of a course of ECT, but the treating/prescribing psychiatrist should explore memory problems at least weekly during a usual ECT course.
- The psychiatrist administering the ECT should also ask about side effects and intervene if needed, although they may not be able to consider the whole clinical picture.
- Simple checks with each treatment include orientation for person, place and time, and informal assessment of anterograde and retrograde memory, by asking about distant memories, recent memories and memories which should have been laid down following the commencement of the course of ECT.
- For maintenance ECT, cognitive assessment should be done as a baseline prior to starting and as indicated thereafter, but not less than 12 monthly or after 12 treatments, whichever comes first (see Section 7.4 – Frequency and number of treatments).
- s. 201 of MHA 2014 requires monthly reporting of serious side effects of ECT, which could include significant and persistent memory deficits.

9.4.1 Formal cognitive screening

Formal cognitive screening **should target:**

- Retrograde amnesia – time to reorientation should be assessed using a structured scale after each ECT treatment and reviewed prior to each ECT treatment, so that the ECT treatment approach can be adjusted if there are signs that significant retrograde amnesia is developing.
- Anterograde amnesia – a cognitive assessment tool such as the Brief ECT Cognitive Screen should be administered pre ECT and after the first week of treatment to detect early emerging deficits so treatment can be adjusted

See also section 5.1.8 - Baseline and post treatment measurement.

If the patient has had previous courses of ECT, cognitive adverse effects associated with prior treatment courses must be taken into consideration in reviewing the current course, as a cumulative effect may be seen.

9.4.2 Managing deterioration of cognitive functioning

The prescribing psychiatrist should consider any contribution from concurrent medications or the patient's medical status. Advanced patient age, low cognitive reserve, and the presence of comorbid neurological disorders may also be relevant, but the importance or effect of these factors is yet to be fully established.

Several treatment factors have been demonstrated to be associated with more severe cognitive side-effects of ECT including memory impairment. These include:

- Bitemporal electrode placement.
- Higher dose above seizure threshold.
- Increased frequency of treatments.
- Use of sinewave ECT.

Potential treatment options include:

- Changing from bilateral electrode placement to right unilateral electrode placement or from right unilateral to left unilateral (remember re-consenting is required).
- Decreasing the stimulus dose.
- Switching from brief pulse to ultrabrief pulse with some electrode placements.
- Re-titrating seizure threshold to confirm dosing.
- Changing the interval between treatments; for example, if treatment frequency started at 3 times a week, decrease it to 1–2 times a week.
- Suspending the course of treatments.
- Considering steps to reduce the dose of anaesthetic (e.g., using ketamine or remifentanil or alfentanil) to reduce the charge used, after re-titrating.

Patients with cognitive impairment at completion of an ECT course should have at least one repeat cognitive assessment one month later as part of routine clinical follow-up in order to ensure resolution of, or improvement in, cognitive impairment. Further detailed specialist cognitive assessment should be administered if significant impairment persists.

9.5 Managing other adverse events

- Immediate side effects such as headache, myalgia, nausea, and drowsiness, should respond to symptomatic or supportive therapy.
- Muscle pain (myalgia) due to succinylcholine fasciculations usually lessens over the first few treatments in an ECT course and is uncommon later; however it should be discussed with the anaesthetist if problematic.

- Appropriate use of a mouthguard and adequate muscle relaxation should minimise the risk of tongue or dental injuries due to temporalis muscle stimulation. However substantial dental problems should be reviewed by a dentist.

Guideline 10: Continuation and Maintenance ECT

ECT is a highly effective treatment, particularly for depression. However, if treatment is stopped abruptly, the risk of immediate relapse after an acute course of ECT can be as high as 50%. To prevent this, suitable psychotropic medication is generally introduced prior to the end of the acute course of ECT and continued afterwards. However, if such treatments are not effective in preventing illness relapse, some patients require continuation or maintenance ECT.

Continuation ECT (cECT) is ECT administered in the 6 months following a successful course which has achieved remission of the acute illness, with the aim of preventing relapse of symptoms. It is usually given weekly to monthly.

Maintenance ECT (mECT) is ECT administered more than six months after treatment of the acute illness, at anywhere between 1 to 12 week intervals, with the objective of preventing a future episode or recurrence.

10.1 Augmentation of cECT and mECT with pharmacotherapy for depression

cECT and mECT are generally given in combination with pharmacotherapy, and this approach is recommended.

At the point of publication of this guideline, there is minimal research regarding cECT as monotherapy for depression. There have been studies that suggest benefit of cECT when given in combination with pharmacotherapy. A meta-analysis of a few small, randomised trials demonstrated superior efficacy of pharmacotherapy combined with cECT and mECT in reducing risk of relapse and recurrences of depression for one year after remission from an acute course of ECT, when compared with pharmacotherapy alone.

10.2 Indications for mECT

Most patients do not require mECT after their first course of ECT. In addition, where there are significant comorbidities, such as personality disorder or substance use disorder, these should always be evaluated and addressed first before mECT is considered.

Current guidelines recommend that mECT may be suitable for patients:

- Who gained full remission from ECT and have previously experienced multiple relapses on medication.
- Who responded to their index ECT and request mECT.

mECT is less suitable as a maintenance option when:

- Time between episodes is long.

- There are significant medical comorbidities.
- There was limited response to the index course of ECT.
- Remission was maintained on an antidepressant and the relapse requiring ECT was caused by non-adherence.
- There has not yet been a trial of lithium augmentation or other suitable pharmacotherapy options.
- Patient preference is to try other options.
- Significant cognitive side effects were experienced.

10.3 Conclusion of index ECT, frequency of mECT and end of mECT course decisions

- For patients considering mECT, a process of tapering the frequency of index ECT (step-down ECT) is ideal and is best guided by the patient's clinical response and preference.
- Generally, step-down ECT is administered weekly for 1 month, biweekly for 2 months and monthly for 3 months.
- mECT can be initiated at either a fixed frequency (e.g. monthly) or gradual decreasing frequency (e.g. moving gradually from 4 weekly to 6, 8 or even 12 weekly) based on the patient's clinical needs and history of relapses.
- Attempts should be made to space intervals further if the patient remains well, with options for rescue ECT (a short period of increased ECT treatments e.g. 3-6 treatments given over a two week period) if there are early signs of relapse.
- Varying lengths of treatment are described in the literature and it is possible that there might be patients who would benefit from indefinite treatment. The longest course of treatment described in the literature was 153 months, with the study finding no adverse cumulative cognitive side effects of mECT. However, the study was retrospective in nature and the cognitive tool used was the Mini Mental State Examination (MMSE), a coarse measure of cognitive function.
- mECT should end when:
    - The patient wishes to stop.
    - The patient has maintained remission for a relatively long duration.
    - It has failed to prevent relapses compared with pharmacotherapy.
    - The patient is medically no longer suitable for an anaesthetic.
    - Cognitive side effects emerge, and the shared risk benefit analysis identifies that cognitive side effects outweigh mood benefits.

10.4 Inpatient vs. Outpatient cECT and mECT

cECT and mECT are typically administered as outpatient treatments. This is often preferred by patients as it is less disruptive to their daily routine, and is also more cost effective. However, there are exceptions where a patient may need to be provided an overnight admission either prior to or after treatment. These include:

- Patients who live in remote areas with no alternative accommodation near the hospital.
- Patients with medical comorbidities that require close monitoring after ECT or medical optimisation the night before ECT.
- Patients who are not suitable for day patient anaesthetic.
- Where the service lacks appropriate resources, facilities or systems to provide outpatient ECT.

Appendix 1: Medications and ECT

Antidepressants

The majority of patients with a major depressive episode who respond to ECT are likely to relapse within six months without continuation pharmacotherapy.

If the patient is being treated for unipolar depression, it is essential to review their antidepressant medication with the aim of preventing relapse after response to ECT. There may be little benefit to continuing a medication which has not been effective. Appropriate withdrawal and planning for another antidepressant (usually from a different class) after ECT should be considered. The new antidepressant is usually initiated during or just prior to the end of the ECT course.

Generally, antidepressants have been administered safely during ECT, though practitioners should be aware of the following, and discuss them with the anaesthetist where necessary:

Serotonin Reuptake Inhibitors (SSRIs)

- SSRIs are commonly administered throughout the ECT course and generally considered safe. Some conflicting reports point towards a possible improved result when combined with ECT, while others report no improved results, and others suggest both shortened seizure length and prolonged seizure length.
- Ceasing SSRIs before ECT may be recommended for patients at higher risk of post-ECT delirium (i.e., those on multiple medications, the elderly or those with co-existent dementia).

Tricyclic antidepressants (TCAs)

- There have been reports of adverse cardiac effects, confusion and excessive sedation in patients taking TCAs during ECT.
- TCAs with stronger anticholinergic side effects (amitriptyline, imipramine, trimipramine, clomipramine) have an increased risk of creating post-ECT confusion and should be reduced or discontinued if possible. However, nortriptyline has been shown to cause less confusion during a course of ECT and has the most evidence supporting its use, in combination with lithium, for relapse prevention.
- TCAs lower the seizure threshold and may increase the risk of cardiac arrythmias, particularly in elderly people and people with cardiac problems.

Monoamine oxidase inhibitors (MAOIs)

- MAOIs with ECT have been associated with blood pressure changes, hyperreflexia and seizures. There is an increased risk of hypotension, bradycardia, and post-treatment confusion. However, there are clinical reports of the successful use of MAOIs during ECT.

Other

- There are reports of prolonged asystole and hypotension in patients taking venlafaxine during administration of ECT, However, a recent study indicated that nortriptyline and venlafaxine were not associated with an increase in cardiac events compared to placebo.

Antipsychotics

- The use of antipsychotics during a course of ECT is common and antipsychotics for psychosis have been shown to improve acute positive symptoms and work synergistically with ECT.
- The combination of ECT with clozapine may be of particular benefit for people who have an inadequate response to clozapine alone. However, there may be a risk of prolonged seizures and confusion as clozapine lowers the seizure threshold.
- Typical antipsychotics may lower the seizure threshold, but as with TCAs that have a significant anticholinergic profile (e.g. chlorpromazine, trifluoperazine, thioridazine and fluphenazine), there is an increased risk of post-ECT delirium.
- Typical antipsychotics may induce ECG abnormalities such as prolonged QTc interval.

Lithium carbonate

- Where possible and clinically safe to do so, it is advised to suspend lithium prior to a course of ECT.
    - This is usually practical when lithium is being used to augment an antidepressant.
    - The risks and benefits of suspending lithium in a patient with bipolar disorder are more complex and need careful consideration given the risk of a manic swing if lithium is withdrawn.
- ECT can increase the permeability of the blood-brain barrier and allow more Lithium into the brain at a constant serum level.
- Given lithium's narrow therapeutic index, this can contribute to toxicity, particularly in high therapeutic serum concentrations.
- While concurrent treatment with lithium is well tolerated by some patients, there are several reports of severe confusion resulting from ECT administered to patients taking lithium, particularly when serum levels are at the higher end of the therapeutic range.
- In bipolar disorder, the clinical decision on whether to withdraw lithium must consider the balance between the risk of manic relapse and the potential adverse effects.
- If the decision is to maintain the person on lithium during the ECT course, the evening dose prior to each ECT treatment may be omitted and the morning dose delayed until after recovery.
- Alternatively, a lower regular dose can be used during ECT, aiming for a serum concentration at the lower end of the therapeutic range.

Anticonvulsant mood stabilisers

Anticonvulsant mood stabilisers include drugs such as carbamazepine, valproic acid, gabapentin, lamotrigine, phenytoin and topiramate.

As ECT requires a seizure, anticonvulsants may reduce the efficacy of ECT by increasing the seizure threshold and reducing seizure expression and duration.

Therefore, consideration should be given to withdrawing anticonvulsants prior to an ECT course.

- Where possible, an anticonvulsant being used to augment an antidepressant should be withdrawn.
- In bipolar disorder, the clinical decision on whether to withdraw the anticonvulsant must consider the balance between the risk of manic relapse and the potential adverse effects on the seizure.
- Anticonvulsants should be continued in patients with seizure disorders.

It is preferable to stop the anticonvulsant well before the commencement of the ECT course, because if it is not fully washed out, the remaining anticonvulsant at first treatment may increase the seizure threshold at titration, and result in a higher stimulus dose.

If the anticonvulsant needs to be continued:

- It may be possible to reduce the dose to the lower end of the therapeutic range, or to reduce the dose as the ECT course proceeds.
- It is recommended to withhold the evening dose prior to each ECT treatment and to delay the morning dose until after recovery from the treatment.

Where the anticonvulsant is being used for a seizure disorder, these changes should occur in consultation with the treating neurologist.

As higher charges may be used for treatment, greater attention needs to be given to monitoring for cognitive side effects.

Medication can be restored to pre-ECT levels at the completion of the ECT course.

Benzodiazepines

- The concurrent use of benzodiazepines with ECT may result in failure of treatment and should be avoided.
- Use of benzodiazepines (particularly those with a longer half-life), during a course of ECT may:
    - Increase the seizure threshold.
    - Increase the risk of cognitive impairment.
    - Reduce the seizure length and efficacy.
- Non-benzodiazepine hypnotics act in similar ways to benzodiazepines and can have similar detrimental effects on ECT if given to the patient close to an ECT treatment.

- If there is a risk of withdrawal seizures with abrupt cessation, the dose can be tapered and ceased early in the course as the anticonvulsant effect of ECT will mitigate against this risk. The effect on seizure threshold will need to be managed.
- If ECT is to proceed before an adequate wash out of benzodiazepines, the use of flumazenil may be considered to acutely reverse the effects of benzodiazepines. However, the effects of acute withdrawal need to be considered, and some advocate the use of midazolam after the ECT treatment to avoid withdrawal symptoms.
- If benzodiazepines are continued, greater attention needs to be given to monitoring for cognitive side effects.

Diabetic medication

- Depression can destabilise diabetic control. Therefore, as depression improves through the course of ECT, the dose of diabetic medication may need to be reduced to prevent hypoglycaemic episodes.
- Blood sugar levels should be monitored closely during an ECT course as dosing of oral hypoglycaemics needs to take into consideration fasting prior to ECT and hyperglycaemia secondary to the seizure.
- The use of GLP1-receptor agonists requires consultation with anaesthetists because of the increased risk of reflux and aspiration due to/because of gastric stasis.
- On the morning of each ECT treatment:
    - Oral hypoglycaemics should be withheld until after treatment, unless instructed otherwise by the anaesthetist.
    - For patients using insulin, it is advisable to consult an endocrinologist or anaesthetist about the management of their treatment on the morning of ECT.
    - Patients using insulin should be placed first on the list and returned to the ward as soon as practical to have breakfast and their diabetic medication.

Theophylline and bupropion

- Theophylline and bupropion can increase seizure duration. Where possible, they should be ceased prior to the ECT course commencing.

Diuretics

- Diuretics should be avoided on the morning of ECT to avoid post-ictal urinary incontinence.

Acetylcholinesterase inhibitors

- Acetylcholinesterase inhibitors may potentiate the bradycardia from the stimulus and Suxamethonium.

- They can potentiate the muscle relaxant effect of Suxamethonium, particularly with rivastigmine which also inhibits butyryl cholinesterase, the enzyme which metabolises Suxamethonium.
- There are several case reports of the safe use of donepezil and rivastigmine during ECT. The continued use of these drugs should be discussed with the anaesthetist.
- There are also case reports of acetylcholinesterase inhibitors having a protective effect against ECT-induced cognitive impairment, but the usefulness of this approach remains uncertain.

Appendix 2: Abbreviations

ACE-R	Addenbrooke Cognitive Examination
ANZCA	Australian, New Zealand College of Anaesthetists
BDI	Beck Depression Inventory
BPRS	Brief Psychiatric Rating Scale
CCF	Congestive Cardiac Failure
CTG	Cardiotocography
cECT	Continuation Electroconvulsive Therapy
CGI-I	Clinical Global Impression – Improvement
CGI-S	Clinical Global Impression – Severity
COPD	Chronic Obstructive Pulmonary Disease
ECT	Electroconvulsive Therapy
EEG	Electroencephalogram
EMI	Electro Medical Interference
GDS	Geriatric Depression Scale
HaDSCO	Health and Disability Services Complaints Office
HDRS	Hamilton Depression Rating Scale
ICD	Implanted Cardiac Defibrillator
KICA	Kimberly Indigenous Cognitive Assessment Tool
LART	Left Anterior Right Lateral
MAOI	Monoamine Oxidase Inhibitor
MADRS	Montgomery-Asberg Depression Rating Scale
mECT	Maintenance ECT
MHAS	Mental Health Advocacy Service
MHA	Mental Health Act 2014
MHT	Mental Health Tribunal
MMSE	Mini-Mental State Examination
MOCA	Montreal Cognitive Assessment Scale
MRI	Magnetic Resonance Imaging

NICE	National Institute for Health and Care Excellence
NMS	Neuroleptic Malignant Syndrome
NSQHS	National Safety and Quality Health Service
OCP	Office of Chief Psychiatrist
QIDS	Quick Inventory of Depression Symptomology
RANZCP PPG	Royal Australian New Zealand College of Psychiatrists – Professional Practice Guidelines
RUDAS	Rowland Universal Dementia Assessment Scale
RUL	Right Unilateral
SSRIs	Serotonin Reuptake Inhibitors
TCAs	Tricyclic Antidepressants
TGA	Therapeutic Goods Act

Development of the guidelines

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- The Royal Australian and New Zealand College of Psychiatrists
- Royal College of Psychiatrists UK
- National Institute for Health and Care Excellence (NICE)
- The International Society for ECT and Neurostimulation.

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The Working Party's progress was significantly disrupted by the impact of COVID-19, and has therefore had some changes in its membership over the prolonged course of the work. Additional contributions were sought on specialist areas as required.

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Resources and related documents

The ECT Working Party commenced with a review of relevant legislation. A literature search was conducted to identify contemporary evidence about ECT treatment, technology and practice. The Working Party also drew from comprehensive reviews of the evidence and guidance on best practice, in particular:

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