Policy Directive

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Electroconvulsive Therapy: ECT Minimum Standard of Practice in NSW

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Functional Sub group Clinical/ Patient Services - Mental Health
Clinical/ Patient Services - Anaesthetics
Clinical/ Patient Services - Nursing and Midwifery
Clinical/ Patient Services - Governance and Service Delivery

Summary This Policy defines minimum standards for the use of electroconvulsive therapy (ECT) in New South Wales. The standards apply to all facets of care, including the indications for treatment, potential risks and strategies to minimise them, issues of consent, facilities, anaesthesia, application of the procedure, and the required quality improvement framework.

**Amended 8/11/13: Please note that Section 8.3, of Attachment 1 contained incorrect advice in relation to consent to ECT for people under 18 years of age. Refer to Section 8.4 of Attachment 2: Guidelines: ECT Minimum Standards of Practice in NSW for the correct information.

Replaces Doc. No. Electroconvulsive Therapy (ECT) [PD2010_068]

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Applies to Local Health Networks, Board Governed Statutory Health Corporations, Chief Executive Governed Statutory Health Corporations, Specialty Network Governed Statutory Health Corporations, Affiliated Health Organisations, Public Health System Support Division, Community Health Centres, Public Hospitals

Audience Clinical, nursing, mental health, emergency departments

Distributed to Public Health System, Divisions of General Practice, Health Associations Unions, Ministry of Health, Private Hospitals and Day Procedure Centres, Tertiary Education Institutes

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Policy Manual Patient Matters

Director-General

File No.

ELECTROCONVULSIVE THERAPY (ECT)

PURPOSE

This Policy Statement defines minimum requirements that must be met in the delivery of electroconvulsive therapy (ECT) in New South Wales.

These requirements apply to all facets of care, including the indications for treatment, potential risks and strategies to minimise them, issues of consent, facilities, anaesthesia, application of the procedure, and the required quality improvement framework.

MANDATORY REQUIREMENTS

The minimum requirements that must be met by health care providers and the health care system are detailed in Attachment 1.

This policy statement is to be read in conjunction with the Guidelines: ECT Minimum Standards of Practice in NSW (Attachment 2).

IMPLEMENTATION

Roles and responsibilities of the NSW Department of Health:

- Provide advice and assistance for the implementation of this policy.
- Monitor and evaluates the health system implementation of standards for ECT.

Roles and responsibilities of Chief Executives:

- Assign responsibility, personnel and resources to implement the standards for ECT.
- Report on the implementation and evaluation of ECT standards to the NSW Department of Health.

Roles and responsibilities of the health service executives responsible for clinical operations and governance:

- Ensure successful implementation of the ECT standards.
- Monitor and evaluate the implementation of ECT standards across their services and feedback evaluation results to staff.
- Ensure the ECT standards are incorporated into orientation programs for relevant clinical staff.
- Educate relevant clinical staff in the use of the ECT standards.

Roles and responsibilities of hospital, facility, clinical stream, unit managers and heads of departments:

- Locally implement the ECT standards.
- Evaluate compliance with the ECT standards.
- Annually monitor and evaluate local ECT practices and processes in line with the ECT standards.

Roles and responsibilities of all clinicians:

- Ensure their work practices are consistent with the standard for ECT.

REVISION HISTORY

Version	Approved by	Amendment notes
January 2011 (PD2011_003)	Deputy Director-General Strategic Development	Rescinds PD2010_068. Incorporates the Minimum requirements in the delivery of ECT in NSW
November 2010 (PD2010_068)	Deputy Director-General Strategic Development	New policy

ATTACHMENTS

1. Minimum Requirements in the delivery of ECT in NSW
2. Guidelines: ECT Minimum Standards of Practice in NSW.

ELECTROCONVULSIVE THERAPY (ECT)

The following are in the minimum requirements that must be met in the delivery of electroconvulsive therapy (ECT) in New South Wales.

1. Indications for electroconvulsive therapy

1.1 The indication for the use of ECT must be clearly documented in the patient's file, including both the diagnosis and the reason for the choice of ECT.

1.2 A second opinion from a psychiatrist experienced in the practice of ECT should be sought:
- when there is any uncertainty about the recommendation of ECT,
- when ECT is being considered for treatment of indications other than those listed at 1.1 - 1.7 of the *Guidelines: ECT Minimum Standards of Practice in NSW*.

2. Risks of ECT

2.1 There are no absolute contraindications to ECT. The clinician must conduct a case-by-case risk benefit analysis, and take appropriate action to manage the risks of ECT.

2.2 All patients receiving ECT must undergo assessment of cognitive function prior to ECT, during the ECT course, and at the completion of the course.

2.3 Unusual levels of confusion or memory problems detected during the course must prompt a review of ECT prescription and technique.

3. Consent and legal issues

3.1 The administration of, and consent for, ECT must comply with the provisions of the NSW Mental Health Act 2007.

4. ECT facilities

4.1 All ECT facilities must comply with the relevant standards specified by professional bodies and NSW Health.

5. Preparing the patient for ECT

5.1 A pre-ECT work-up must be performed and documented, including a thorough history, physical examination, clinically relevant investigations and specialist consultations. An anaesthetic consultation is mandatory.

5.2 Medical and psychotropic medications must be reviewed and adjusted as appropriate before commencing a course of ECT.

5.3 A check list of pre-ECT procedures must be completed before each treatment.

6. Administration of ECT

6.1 The choice of ECT electrode placement, stimulation parameters and electrical dosage for each patient must be based on considerations of efficacy and cognitive outcomes, and should be in accordance with accepted guidelines.

6.2 The ECT machine must have EEG monitoring capacity, be maintained in good working order and serviced at least once every 12 months.

6.3 Sine-wave ECT should not be used.

6.4 EEG monitoring should be routinely performed, and EEG strips filed chronologically so that they can be easily accessed to review the treatment course and guide decisions about dosing.

6.5 The NSW Health policy "Correct patient, correct procedure, correct site" (PD2007_079) must be observed during the ECT procedure.

6.6 A minimum of three people must be present at the treatment: a medical officer appropriately trained and skilled in ECT, a medical officer appropriately trained and skilled in anaesthesia, and a nurse trained in anaesthetic and resuscitation techniques and modern ECT practice.

6.7 Cancellation of an ECT treatment for any reason must be documented and reviewed.

7. Anaesthesia for ECT

7.1 An experienced and appropriately qualified consultant anaesthetist must be responsible for overseeing anaesthesia in the ECT service.

7.2 The anaesthetic technique must be documented in the patient record in accordance with guidelines of the Australian and New Zealand College of Anaesthetists.

7.3 Regular morbidity reports must be provided to the site ECT Committee.

8. ECT in children and adolescents

8.1 All young patients must have a comprehensive medical assessment and a psychiatric assessment. A specialist child and adolescent psychiatrist should either conduct the assessment, or be consulted when direct assessment is not possible.

8.2 Consent issues require specific attention in young people. The ECT procedure must be clearly explained to the patient and family, with due consideration of the patient's age.

8.3 Please refer to section 8.4 of ATTACHMENT 2 for correct information relating to consent for treatment of children.

9. Continuation, maintenance and outpatient ECT

9.1 Continuation and maintenance ECT are useful techniques to reduce the risk of relapse in patients who have responded to an index initial course of ECT. They should be considered where there is a history of relapse despite adequate pharmacotherapy, an intolerance of alternative treatments, or a preference for this treatment stated by the patient.

9.2 ECT schedule, electrode placement, stimulus parameters and course duration should be individually tailored for each patient.

9.3 Treatment and consent must be fully documented, and all relevant aspects of the Mental Health Act must be complied with.

9.4 The patient must be reviewed by the treating psychiatrist at least monthly to assess progress and the continuing use of ECT. The patient must also be reassessed by an anaesthetist at least every six months.

9.5 Patients having outpatient ECT must be able to comply with conditions including adherence with the ECT schedule, not driving on the day of treatment, fasting prior to treatment, continuing to take appropriate medications, and having a responsible person to take them home after recovery.

10. Credentialing of medical staff and clinical privileging

10.1 Psychiatrists prescribing or administering ECT must be credentialed for this procedure by the Medical and Dental Appointments Advisory Committee of their Area Health Service.

10.2 Assessment for credentialing must consider both evaluation of the individual and an assessment of technique as described in Appendix 3 of the Guidelines: ECT Minimum Standards of Practice in NSW.

10.3 The clinical director of the ECT service will review each psychiatrist's clinical privileges in ECT annually, in conjunction with the Chair of the ECT Committee.

10.4 Royal Australian and New Zealand College of Psychiatrists minimum experience requirements for psychiatric trainees or career medical officers (CMOs) are not necessarily sufficient to allow a trainee or CMO to administer unsupervised ECT. The Chair of the ECT committee must determine that the trainee or CMO meets the standards outlined in Appendix 3 of the Guidelines: ECT Minimum Standards of Practice in NSW before the trainee can give ECT without a privileged medical officer being present.

11. Nursing and coordination requirements for ECT patients

11.1 A nurse competent in ECT procedures must be involved in all aspects of patient care during the delivery of ECT.

11.2 Dedicated hours must be provided by the organisation for an identified ECT Coordinator, appropriate to the workload of the unit.

11.3 The ECT Coordinator, in conjunction with the medical leader of the ECT service, will oversee the supervision, organisation and planning of all aspects of ECT delivery.

12. Clinical governance

12.1 Each Area Health Service or organisation with ECT facilities should establish a Standing Committee that monitors the achievement and maintenance of minimum standards of clinical practice across all ECT programs within its jurisdiction.

12.2 Each Area Health Service or organisation with ECT facilities should establish a system of monitoring and auditing the ECT services at its individual hospitals.

12.3 Each Area Health Service or organisation with ECT facilities will report against a set of key performance indicators established by NSW Health.

Guidelines:

ECT Minimum Standards of Practice in NSW

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Electroconvulsive Therapy (ECT)

Purpose

These Guidelines describe the minimum standards for the use of electroconvulsive therapy (ECT) in New South Wales.

Application of the Guidelines will assist in ensuring that people who will benefit from ECT receive evidence-based treatment delivered with professionalism and respect.

The Guidelines apply to all facets of care, including the indications for treatment, potential risks and strategies to minimise them, issues of consent, facilities, anaesthesia, application of the procedure, and the required quality improvement framework.

Key Principles

ECT is a safe and effective treatment for people with severe major depressive disorder and some other mental illness. Advances in the delivery of ECT, including anaesthesia and muscle relaxation during the brief treatment procedure and carefully adjusted dosing schedules, ensure that treatment is well tolerated.

These NSW Health Guidelines for ECT Minimum Standards of Practice provide a comprehensive overview of ECT as part of the modern armamentarium of therapies for mental illness. They describe each element of the treatment pathway, from the indications for ECT, risks, consent and legal issues, to the treatment itself, including the facilities that are required, patient preparation, anaesthesia and administration of ECT. Special issues include the potential use of ECT in children and adolescents – which remains a rare occurrence – and the use of continuation and maintenance ECT. Requirements for quality control and clinical governance are also addressed.

The Guidelines are detailed and descriptive. A separate Policy Statement defines the minimum, measurable standards that must be maintained by health care providers and the health care system.

Use of the Guidelines

These guidelines should be used in conjunction with Area Health Service or facility protocols, as appropriate.

Area Directors of Mental Health should:

- bring the attached advice to the attention of medical staff and other clinicians providing ECT services in the Area; and
- ensure that relevant Area Mental Health service protocols are reviewed to include the Guidelines key points as practice standards for the ECT.

Revision History

Version	Approved by	Amendment notes

Attachments

1. Guidelines for ECT Minimum Standards of Practice in NSW

Contents

Introduction

Electroconvulsive therapy (ECT) is a safe and effective treatment for people with severe major depressive disorder and some other mental illness. Advances in the delivery of ECT, including anaesthesia and muscle relaxation during the brief treatment procedure and carefully adjusted dosing schedules, ensure that treatment is well tolerated by the patient.

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The Guidelines are detailed and descriptive. A separate Policy Statement defines the minimum, measurable standards that must be maintained by health care providers and the health care system.

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These Guidelines and the accompanying Policy Statement were developed by a Working Group with the following membership:

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Abbreviations

AACAP	American Academy of Child and Adolescent Psychiatry
ACE-R	Addenbrooke's Cognitive Evaluation – Revised
ANZCA	Australian and New Zealand College of Anaesthetists
ECT	Electroconvulsive therapy
MHA	New South Wales Mental Health Act (2007)
MHRT	Mental Health Review Tribunal
MMSE	Mini-Mental State Examination
3MSE	Modified Mini-Mental State Examination
RANZCP	Royal Australian and New Zealand College of Psychiatrists
RUDAS	Rowland Universal Dementia Assessment Scale

SECTION 1

Indications for electroconvulsive therapy

Electroconvulsive therapy (ECT) has been used for more than 70 years in the treatment of psychiatric disorders. The most common indication for ECT in Australia is major depressive episodes. However, ECT may also have a role in the treatment of other conditions including mania, schizophrenia, schizoaffective disorder, catatonia, malignant neuroleptic syndrome and Parkinson's disease.

The preferences of the patient and their family and carers should be considered in the decision to treat any patient with the following indications with ECT.

1.1 Major depressive episode

ECT is a highly effective treatment for major depression, demonstrating remission rates of more than 60% when the most effective forms of ECT are used (Sackeim 1993, 2000; McCall 2002). Remission rates have been as high as 83% for patients with major depression with psychotic features (Petrides et al 2001). The superiority of ECT over sham-ECT (a placebo form of treatment) has been established in a series of randomised controlled trials conducted between 1956 and 1985, and confirmed in meta-analyses (Janicak et al 1985; Group 2003; Kho et al 2003; Pagnin et al 2004). Efficacy was demonstrated despite the inclusion of trials that used forms of ECT now known to be relatively ineffective, such as low-dose right unilateral ECT.

ECT has also been compared to a range of medications in randomised controlled trials, most commonly tricyclic antidepressants or monoamine oxidase inhibitors. One study compared ECT to a more modern antidepressant (paroxetine) and found that moderate dose right unilateral ECT was superior to medication (Folkerts et al 1007). There are no randomised controlled studies comparing ECT to newer dual-action anti-depressants such as venlafaxine. Despite these limitations, the meta-analyses described above demonstrate that ECT is superior in efficacy to medication.

Response to ECT may be predicted by a number of clinical variables including the depression sub-type and the degree of medication resistance (Sobin et al 1996; Fink et al 2007; Rasmussen et al 2009). Response rates in randomised controlled trials also vary greatly according to treatment technique, particularly electrode placement and the dose relative to seizure threshold (Sackeim et al 1993, 2000; Mukherjee et al 1994).

ECT is an appropriate 'first-line' treatment when a rapid response to treatment is required (for example, a high risk of suicide or inadequate oral intake) or where medication cannot be tolerated or is contraindicated.

1.2 Manic episode

ECT was used extensively in the treatment of manic episodes prior to the advent of effective pharmacological treatments. A review of pooled, non-randomised data regarding use of ECT in mania suggests rates of remission or clinical improvement in up to 80% of patients (Mukherjee et al 1994). Only three randomised controlled studies have compared pharmacological treatment and ECT for the treatment of manic episodes. ECT was more rapidly effective than lithium carbonate in acute mania in an 8-week trial (Small et al 1988). In augmenting chlorpromazine, bitemporal sine-wave ECT was more effective than sham ECT (Sikdar et al 1984). Superior response rates were achieved with ECT in comparison to lithium plus haloperidol in patients who had already failed a trial of either medication alone (Mukherjee et al 1989).

There is some case-based evidence to suggest that ECT may be effective in medication-resistant mania (Mukherjee et al 1994; Fink 2006).

Current guidelines of the Royal Australian and New Zealand College of Psychiatrists (RANZCP) state that ECT to treat manic episodes may be considered in situations where other strategies fail to achieve remission of symptoms.

1.3 Schizophrenia

ECT was used extensively as a treatment for acute schizophrenia from the 1940s to the 1960s. Early studies reported that between 50 and 80% of patients benefited in the short term, however the only two randomised

controlled studies comparing ECT to sham ECT from this era found no benefit, either in functional improvement or global clinical status (Miller et al 1953; Brill et al 1959; Kelly et al 1965). These early studies are difficult to interpret because of major methodological flaws, but they suggested that patients with rapid onset, a short duration of illness, or predominant catatonic or affective features may be more likely to respond (Fink et al 1996).

With the advent of effective antipsychotic medications the use of ECT in the treatment of schizophrenia has declined. However in a recent survey of Australian ECT services, schizophrenia was identified as the primary indication in 9.6% of patients, suggesting the ongoing perception of clinical benefit amongst Australian psychiatrists (Chanpattana 2007). Unfortunately the evidence base supporting this perceived benefit is limited and allows few definitive conclusions to be drawn (Gazdag et al 2009).

In a recent Cochrane review of the efficacy and safety of ECT in schizophrenia, only 24 randomised trials conducted over the last 50 years met criteria for inclusion (Tharyan et al 2005). Many had significant methodological flaws, including poorly defined patient samples and treatment regimens, and inadequate sample sizes and trial durations (Gazdag et al 2009).

Only two small studies have compared ECT alone with sham ECT plus pharmacotherapy: ECT was equivalent to chlorpromazine in combination with sham ECT (Bagadia et al 1983), and ECT was superior to risperidone in lorazepam-resistant catatonic schizophrenia (Girish 2003).

All other sham-controlled studies of ECT in schizophrenia either included concomitant treatment with antipsychotics or allowed their ongoing prescription during the trial, and therefore explored the efficacy of ECT as an augmentation strategy rather than monotherapy (Taylor et al 1980; Agarwal et al 1985; Brandon et al 1985; Abraham et al 1987; Sarkar et al 1994; Sarita et al 1998; Goswami et al 2003; Ukpong et al 2002). Results of these studies are mixed, with some finding an advantage for ECT in speed and/ or extent of response, but others finding no difference between the groups (Braga et al 2005).

When all the available randomised data was pooled, ECT resulted in greater and faster rates of global and symptomatic improvement than sham ECT or placebo in the short-term treatment of schizophrenia (Tharyan et al 2005). However any advantage of ECT appears to be lost within 6-8 weeks of its cessation. Monotherapy with antipsychotics was superior to ECT alone, but there was a non-significant trend favouring the combination of antipsychotics and ECT compared to antipsychotics alone. Interpretation of these findings is difficult because the analysis pooled results from heterogeneous patient samples, including those with acute and chronic symptoms, and those with catatonic features who may well have a differential response to treatment (Gazdag et al 2009).

The use of ECT in combination with antipsychotics in chronic-treatment resistant schizophrenia has been poorly studied, though many argue that it may have a significant role given the disabling nature of this condition (Braga et al 2005; Goswami et al 2003). Open studies of the combination suggest an advantage over antipsychotics alone in medication-resistant patients (APA 2001; Braga et al 2005). Several case reports and series suggest that the combination of clozapine with ECT in treatment-resistant schizophrenia may be beneficial and safe, but no randomised controlled trial has addressed this issue (Kho et al 2004; Braga et al 2005).

The lack of well-designed, large-scale studies addressing the role of ECT in the treatment of schizophrenia makes it difficult to make definitive recommendations on its use. The available data suggests that ECT is a relatively safe treatment, which may be of value when used in combination with antipsychotic medications, both in the treatment of acute schizophrenia and in the prevention of relapses in those who respond to an index course of ECT. The role of ECT in chronic treatment-resistant schizophrenia is unclear, but a growing body of literature suggests that it may be of benefit in some cases.

1.4 Schizoaffective disorder

There is little evidence on the use of ECT in schizoaffective disorder. Case-based literature suggests that ECT may be effective in treating affective symptoms, but the heterogeneity of the disorder makes it difficult to draw firm conclusions (Ries et al 1981; Fear 2005). ECT may have a role in the management of affective or psychotic symptoms in schizoaffective disorder when other treatment options have failed.

1.5 Catatonia

Most information on the use of ECT in catatonia is drawn from single case reports or case series (Rohland et al 1993;

Hawkins et al 1995; Hatta et al 2007). They suggest that ECT is a very effective treatment for catatonia regardless of the underlying cause. Some studies have indicated that ECT may be less effective in catatonic schizophrenia than in catatonia related to affective disorders, but other studies have failed to find any difference in response (Rohland et al 1993; Abrams et al 1997). Many case reports suggest that ECT can be effective in treating catatonia related to organic conditions (Gazdag et al 2009).

ECT is effective in patients who have failed to respond to initial treatment with benzodiazepines. In a recent study, ECT was superior to oral risperidone in 18 inpatients with non-organic, non-functional catatonia (Girish 2003).

Several case series have demonstrated that ECT is effective in malignant catatonia, and it should be considered as a 'first-line' treatment in this condition (Philbrick et al, 1994; Fear 2005; Baker et al 2008).

1.6 Neuroleptic malignant syndrome

The utility of ECT in neuroleptic malignant syndrome (NMS) is well recognised, despite the absence of randomised controlled data (APA 2001). ECT is often used when pharmacological treatments fail to control the disorder, and can be potentially life saving in severe cases (Trollor et al 1999). Available evidence suggests benefit in up to 90% of cases of NMS. In addition, ECT is sometimes used to control psychiatric symptoms whilst neuroleptics may be contraindicated during an episode. Particular care is required in the anaesthetic management of patients with NMS, as autonomic instability is a key feature.

1.7 Parkinson's disease

ECT may have a role in the management of the motor symptoms of Parkinson's disease even in the absence of a psychiatric disorder, especially in patients who are refractory to pharmacological treatment or develop intolerable medication side-effects. In a small randomised controlled study in patients with severe 'on-off' phenomena, ECT was more effective than sham ECT in prolonging the duration of 'on' periods (Andersen et al 1987). In a review of published case reports, Kennedy et al found that 58 of 75 patients who had ECT for motor symptoms improved, however patients were particularly vulnerable to cognitive side-effects (Kennedy et al 2003).

If ECT is being considered for the treatment of the motor symptoms of Parkinson's disease, a neurologist experienced in the management of this condition must be consulted regarding the appropriateness of the treatment.

1.8 Other indications

Case series and reports, but no randomised controlled trials, describe the successful use of ECT in conditions including obsessive-compulsive disorder, chronic pain, post-traumatic stress disorder and severe agitation in dementia (Maletzky et al 1994; Roccaforte et al 2000; Grant et al 2001; Rasmussen et al 2002; Margoob et al 2009). The efficacy of ECT in these conditions is not clearly established and, in general, ECT should not be used primarily to treat these disorders.

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SECTION 2

Risk of ECT

2.1 Non-cognitive risks of treatment

ECT is a safe, effective treatment: no deaths associated with ECT have been reported in NSW for the last 25 years, during which time more than 200,000 ECT treatments have been administered. Risks of ECT must be considered in context, as untreated depression carries an increased morbidity and mortality from suicide and also from medical disorders such as myocardial infarction.

There is no absolute contraindication to the administration of ECT. The balance of risks and benefits must be assessed for each individual.

Cardiovascular risks

Most serious complications of ECT are cardiovascular in nature, and can be categorised as follows:

- Occurring during and immediately following the electrical stimulus: sinus arrest, sinus bradycardia and hypotension resulting from a pronounced parasympathetic stimulus.
- Occurring during the seizure: tachycardia and hypertension, resulting from increased sympathetic outflow and adrenal catecholamine release.
- Occurring immediately following the seizure: a rapid fall in heart rate and blood pressure to pre-treatment levels. It is during this post-ictal period that most serious cardiac complications occur.
- Prominent cerebrovascular changes occur during the seizure, including an increased cerebral blood flow and increased intracranial and intraocular pressures.

Non-cardiovascular events

Non-cardiovascular events associated with ECT include:

- suxamethonium-induced muscle fasciculations and muscle soreness
- tonic spasm of the temporalis muscle due to the direct application of the electrical stimulus to the muscle
- generalised tonic/clonic muscle contractions with the seizure
- headache, which is often relieved by a simple analgesic such as aspirin or paracetamol.

High risk situations

Factors that increase the risk associated with ECT include:

- recent myocardial infarction
- unstable angina
- poorly compensated congestive cardiac failure
- severe valvular heart disease
- aortic and intracranial aneurysms
- cerebral space occupying lesions with raised intracranial pressure
- recent cerebral haemorrhage and infarction
- retinal detachment and glaucoma.

Recent myocardial infarction: The risk is highest in the first 10 days after infarction. Arrhythmia and, less commonly, myocardial rupture, are possible complications. The risk is likely to have minimised by three months after the infarct. There is little evidence to guide clinical decision-making in this situation.

Aortic and cerebral aneurysms: Hypertension associated with the seizure theoretically risks an aneurysm rupturing, but there have been no reports of such an occurrence and several reports of the safe administration of ECT in patients with aneurysms.

Cerebral haemorrhage and infarction: Depression is common after stroke and commonly associated with cerebral small vessel disease manifest on 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.

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.

Retinal detachment and glaucoma: Suxamethonium and seizure 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.

Other risks

Other factors that may increase the risk associated with ECT include:

- poor dentition
- obesity
- asthma and chronic obstructive pulmonary disease
- osteoporosis
- skull defects and titanium plates
- older age
- pregnancy and puerperium.

Poor dentition: A loose or corroded tooth may break during the ECT stimulus due to temporalis spasm and jaw clenching, and could possibly be inhaled.

Obesity: Obesity can increase the risk of airway and oesophageal reflux complications during a general anaesthetic.

Osteoporosis: Osteoporosis increases the risk of fractures if the seizure is not well controlled, emphasising the need for good relaxation. Using a cuffed limb technique will ensure that a motor seizure is avoided.

Skull defects and titanium plates: While not a barrier to administering ECT, a skull defect or a titanium plate over a skull defect necessitate placement of the stimulus electrodes elsewhere, due to the risk of a low impedance pathway to the underlying brain. Options may include bifrontal and left unilateral electrode placements.

Pregnancy and puerperium: ECT may be considered in pregnancy, particularly in the first tri-mester, when there are significant risks of teratogenesis associated with some psychotropic medications including mood stabilisers. Many psychotropic medications are problematic in the late stages of pregnancy due to neonatal toxicity, and ECT may be an alternative. No teratogenic risks have been associated with brief exposure to the agents commonly administered with ECT, such as propofol, thiopentone, suxamethonium, atropine, and esmolol.

An obstetric consultation is advised, along with fetal heart rate monitoring before and after each treatment after 14 weeks' gestation. After 20 weeks' gestation, placing a wedge under the patient's right hip to maximise fetal blood flow should be considered. The anaesthetist may consider the routine use of an antireflux agent, and good oxygenation without hyperventilation is standard practice. There should be rapid access to an obstetric facility in the later stages of pregnancy.

With regard to nursing mothers, it is considered safe to breast feed during a course of ECT, as there is no evidence that the agents used with ECT are harmful to the breastfeeding baby.

Elderly and cognitively impaired: There is good evidence that elderly people with a major depressive episode are more likely to respond to ECT than younger people. With appropriate intervention, many common medical illnesses in the elderly are not a barrier to the safe administration of ECT. Elderly people with cognitive impairment can usually proceed to ECT with appropriate measures to reduce post-ECT confusion such as twice-weekly treatment, a right unilateral electrode placement, and an ultra-brief pulse stimulus.

2.2 Cognitive risks of ECT

The occurrence of cognitive side-effects with ECT is well recognised and has been a major source of concern for patients undergoing treatment (APA Taskforce 2000; Donahue 2000). It is however, important to note that the conditions most commonly treated with ECT (major depression, mania and schizophrenia) are also associated with significant cognitive impairment (Porter et al 2007; Reichenberg and Harvey 2007). Many patients report an improvement in memory and cognition as their depression improves after treatment with ECT.

The vast majority of research has been conducted in patients receiving ECT for major depression, and has aimed to characterise the incidence and severity of cognitive deficits associated with ECT (Ingram et al 2008). More recent research studies have aimed to optimise ECT technique in order to maintain efficacy whilst minimising cognitive side-effects (Loo et al 2006).

The cognitive effects associated with ECT may be broadly considered as:

- acute effects
- anterograde memory effects
- retrograde memory effects
- non-memory effects.

Acute effects

General disorientation immediately after ECT is common (Daniel and Crovitz 1982). Orientation to person, place and time generally recover at different rates, with orientation to time generally the slowest to recover (Calev et al 1991). The duration of disorientation is greater with sine-wave stimuli, bitemporal electrode placement, and higher dose above seizure threshold (Daniel and Crovitz 1982; Sackeim et al 1993; McCall et al 2000). Some evidence suggests that longer duration of post-ictal disorientation predicts the severity of retrograde amnesia after ECT (Sobin et al. 1995). Routine measurement of this parameter may be useful in identifying those patients at high risk of developing retrograde amnesia earlier in the ECT course, enabling alterations in treatment technique to minimise this adverse effect (Porter et al 2008).

Anterograde memory effects

Impairment in acquisition and retention of verbal and non-verbal material is frequently observed during and immediately after a course of ECT (Ingram et al 2008). Deficits in 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 two months, and performance often improves during this period, relative to baseline (Sackeim et al 1993). Longer-term follow-up studies have also demonstrated improvement in performance relative to baseline scores (Sackeim et al 2007).

Retrograde memory effects

ECT can cause deficits in retrograde memory for information learnt during, and prior to the treatment course (Lisanby et al 2000; Ingram et al 2008). Deficits in both autobiographical and impersonal memory can occur and tend to be most severe immediately after the index course. Recent memories may be more vulnerable than more remote memories, although some patients have reported loss of memories dating back several years (Donahue 2000; Lisanby et al 2000; Vamos 2008). 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 (Squire et al 1981; Weiner et al 1986; Sackeim et al 2000; Sackeim et al 2007).

Non-memory 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 (Ingram et al 2008).

A number of factors have been reliably demonstrated to be associated with more severe cognitive side-effects of ECT. These factors include:

- bitemporal electrode placement
- higher dose above seizure threshold
- increased frequency of treatments
- use of sine-wave ECT.

Other factors such as patient age, cognitive reserve, and comorbid neurological disorders may also be relevant, but the importance or effect of these factors is yet to be fully elucidated (Legendre et al 2003; Gardner and O'Connor 2008). Recent evidence suggests that the use of ultra-brief pulse width ECT (pulse width of 0.3 milliseconds [msec]) significantly reduces the cognitive side-effects of right unilateral ECT, and may have an important role in reducing the cognitive side-effects of ECT (Loo et al 2008).

Assessment of cognitive function at baseline and completion of a course using a standard screening instrument for cognitive impairment such as the Modified Mini-Mental State Examination (MMSE), Rowland Universal Dementia Assessment Scale (RUDAS) or Addenbrooke's Cognitive Evaluation – Revised (ACE-R) is considered essential (Teng and Chui 1987; Storey et al 2004). Further assessments during the treatment course are recommended in order to assist in early detection of cognitive deficits and facilitate alterations in treatment technique to minimise adverse cognitive effects. Such alterations may include changing electrode placement, reducing stimulus dose or re-titrating seizure threshold to confirm dosing protocol, reducing frequency of treatment or consideration of a switch to right unilateral ultra-brief pulse width ECT.

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 cognitive assessment should be considered if significant impairments persist.

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SECTION 3

Consent and legal issues

3.1 ECT and the *NSW Mental Health Act 2007* (MHA)

The administration of ECT in New South Wales is governed by the MHA and Regulations.

Patient's civil rights, access to appropriate care, the involvement of carers in decision-making, and regulations pertaining to the administration of ECT are promoted and detailed within the Act.

Only medical practitioners are permitted to provide ECT, and it must be performed in a hospital approved for this purpose, whether public or private. A minimum of two medical practitioners must be present, of whom one is experienced in the administration of ECT and another is experienced in anaesthesia.

3.2 Informed consent

Specific requirements govern the information that must be provided to a patient for informed consent for ECT.

The MHA requires that 'fair explanation' must be provided of the techniques or procedures to be followed. This must include an identification and explanation of any technique or procedure about which there is not sufficient data to recommend it as a recognised treatment or to reliably predict the outcome of its performance. Among other provisions, the MHA requires that:

> *'a) a fair explanation must be made to the person of the techniques or procedures to be followed, including an identification and explanation of any technique or procedure about which there is not sufficient data to recommend it as recognised treatment or to reliably predict the outcome of its performance,*
>
> *(b) a full description must be given, without exaggeration or concealment, to the person of any possible discomforts and risks of the treatment (including possible loss of memory),*
>
> *(c) a full description must be given to the person of any expected benefits of the treatment,*
>
> *(d) a full disclosure must be made, without exaggeration or concealment, to the person of any appropriate alternative treatments that would be advantageous to the person,*
>
> *(e) an offer must be made to the person to answer any inquiries concerning the procedures or any part of them,*
>
> *(f) the person must be given notice that the person is free to refuse or to withdraw consent and to discontinue the procedures or any part of them at any time,*
>
> *(g) a full disclosure must be made to the person of any financial relationship between the person proposing the administration of the treatment or the administering medical practitioner, or both, and the facility in which it is proposed to administer the treatment,*
>
> *(h) the person must be given notice of their right to obtain legal and medical advice and to be represented before giving consent,*
>
> *(i) any question relating to the techniques or procedures to be followed that is asked by the person must have been answered and the answers must appear to have been understood by the person,*
>
> *(j) a form setting out the steps in this subsection is to be given to the person and an oral explanation of the matters dealt with in the form is to be given to the person in a language with which the person is familiar.*'

It is particularly important that the patient is aware of and understands the risks of the treatment as might apply to the patient's own circumstances.

The MHA specifies that wherever a patient poses questions about ECT, the answers given to the questions must '*appear to have been understood*'. It is not only the general

information provided which must appear to be understood, but also the answer to the questions subsequently asked by the patient.

Informed consent is given when it is free, voluntary and in writing after the provision of the relevant disclosures. The Act specifies that a person is presumed to be incapable of giving informed consent if affected by medication that impairs the ability of the person to give informed consent.

3.3 ECT and the Mental Health Review Tribunal (MHRT)

Voluntary patients

ECT may be administered to a *voluntary patient* if the patient is capable of, and has given informed consent freely, voluntarily and in writing demonstrating that the procedure is clearly understood. Form 6 `Information and consent - electroconvulsive therapy' of the Mental Health Regulations 2007 outlines the information about ECT that must be given to the patient to ensure their informed consent is provided. Consent is generally given for a course of ECT. This must be in writing in the format prescribed by the Form 6, indicating: that the clinical condition and any history of treatment has been considered; any appropriate alternative treatments have been discussed and understood; and that two medical practitioners, of whom at least one is a psychiatrist, are of the opinion that ECT is:

a. 'reasonable and proper treatment to be administered to the person' and

b. 'necessary or desirable for the safety or welfare of the person'.

An Authorised Medical Officer may apply to the Mental Health Review Tribunal for an ECT consent inquiry if they are unsure whether or not a voluntary patient is capable of giving informed consent. The Authorised Medical Officer must do everything that is reasonably practicable to give notice in writing of the consent inquiry to the patient's primary carer.

The Tribunal will determine whether the person is capable of giving informed consent and have given this consent in this instance. If the Tribunal decides that the person can consent and the person has given consent in writing, then the hospital may administer ECT treatment.

If the Tribunal decides that the person lacks the capacity to consent, or if the person has capacity but refuses treatment, then the hospital may not administer ECT while the person is a voluntary patient.

Involuntary patients

The definition of an 'involuntary patient' also includes a forensic patient, correctional patient, and a person detained in a mental health facility.

ECT may only be administered to an involuntary patient in accordance with an ECT determination made by the MHRT at an ECT Administration Inquiry.

If a mental health facility intends to administer ECT to an involuntary patient the Authorised Medical Officer must first apply to the MHRT for an ECT Administration Inquiry. The Authorised Medical Officer must do everything reasonably practicable to give notice in writing to the primary carer of the person. If at the ECT Administration Inquiry, the Tribunal determines that the patient can consent, and has done so, then the hospital may administer the ECT treatment.

If the Tribunal determines that the patient is incapable of giving informed consent, or is capable of giving informed consent but has refused, or has neither consented nor refused, the Tribunal must then determine if ECT is a reasonable and proper treatment, and is necessary or desirable for the safety or welfare of the patient.

The treating team presents evidence to the Tribunal regarding the patient and their particular circumstances. The Tribunal is responsible for determining the time frame in which treatments are to be administered (not exceeding six months) and the maximum number of individual treatments (which should not ordinarily exceed 12 unless the Tribunal determines otherwise). A determination from the Tribunal has effect for 6 months from the date it is made, unless a shorter period is specified.

In the event that the maximum number of treatments is reached, or where the treatment is not given within the specified time frames and it is considered that further ECT is necessary, a fresh application must be made to the Tribunal. Any substantial change to the course of treatment will also require further consideration by the Tribunal.

Applications for long-term patients

Sometimes there is a need for a long-term involuntary patient to have maintenance ECT on an ongoing basis. Applications for ECT should be made in accordance with

the above requirements. It may be the opinion of the treating team, based on clinical considerations, that more than 12 treatments are required. If so, this is a matter that can be brought to the Tribunal's attention.

Transfers of patients

If, following an ECT Inquiry and determination by the Tribunal, it is proposed to change the venue of treatment, the medical superintendent is to notify the Tribunal of the proposal to have the treatment administered at another facility and the reason for this. Provided the Tribunal is satisfied that this does not require re-consideration of its determination the record will be updated without another hearing. However in some cases the Tribunal may require a fresh application to be lodged and a further hearing held.

'Usual accepted clinical practice'

An application to the MHRT for ECT for an involuntary patient must be supported by medical opinion that the treatment proposed is necessary and appropriate and is in accordance with *usual accepted clinical practice.*

Any proposal for ECT to be carried out other than in accordance with *usual accepted clinical practice must be referred to the Chief Psychiatrist, Mental Health & Drug & Alcohol Office NSW Health, who will then advise whether ECT is clinically appropriate. The Tribunal can be advised that this has occurred.*

More information

The MHRT Civil Hearing Kit (ECT- section 6) details the process, reports and forms necessary for an ECT Consent Inquiry for a voluntary patient and an ECT Administration Inquiry for an involuntary patient. The Hearing Kit is available online at: www.mhrt.nsw.gov.au

3.4 ECT and guardianship

Some forms of medical treatment, including ECT, cannot be consented to by a guardian, including an enduring guardian or the Guardianship Tribunal.

A guardian has no role in relation to the administration of ECT other than as 'primary carer' (s74 MHA). The guardian has an entitlement to be notified if it is proposed to apply for an ECT Inquiry (s78(3)MHA). The MHRT will have regard to the guardian's views as the primary carer, but is not bound by them.

Note that Powers of Attorney relate only to financial and property issues, and not to medical treatment.

3.5 ECT Register

Particulars of proposed administration of ECT are to be entered into an approved register before it is administered. Any differences in the particulars of treatment actually administered are to be subsequently noted and explained in the register.

The register may be inspected at any time by the MHRT, the Principal Official Visitor, an Official Visitor or the Director-General.

3.6 Mental Health Act

The principal staff of the ECT service need to be well versed with the legal requirements and have competency to administer the regulations and use the prescribed forms for the administration of ECT pursuant to the MHA. ECT administered other than in accordance with the Act is unlawful, and penalties apply.

SECTION 4

ECT facilities

4.1 Background

In the past, ECT was administered predominantly in 'stand-alone' ECT suites within psychiatric hospitals. Some such suites are still functioning today. However, 'mainstreaming' of mental health services into general hospitals has led to ECT also being administered within the theatre complex of the general hospital in which the mental health service is based. This section addresses infrastructure requirements for both stand-alone ECT suites and ECT administered within a general hospital theatre.

4.2 Legislation and professional guidelines governing the delivery of ECT

The following legislation and professional guidelines govern the practice of ECT in NSW:

1. RANZCP Memorandum #12, Sections 8.2 to 18.4.1, define the minimum clinical standards as discussed below.

2. In the Australian and New Zealand College of Anaesthetists (ANZCA) *Recommendations for minimum facilities for safe administration of anaesthesia in operating suites and other anaesthetising locations*, Section 4.2 defines design and safety requirements as detailed below. The guidelines produced by ANZCA cover both stand-alone facilities and ECT given within a general hospital operating theatre.

3. *NSW Mental Health Act 2007 & Regulations.*

4. Other appropriate Health Service regulations.

4.3 Stand-alone ECT suites

Stand-alone ECT Suites can provide excellent and clinically effective ECT.

Design

ECT services must be designed in a patient-focused manner that respects the need for autonomy and privacy.

An ECT suite should consist of a minimum of three rooms:

1. A waiting area with access to a toilet and change area. The waiting area should be quiet and separate from other clinical areas, respect patients' need for privacy, and accommodate their level of distress.

2. A treatment / procedure room. The treatment room must comply with the rigorous standards for safety as specified in the ANZCA guideline as below:

   ANZCA section 4.2 ECT Location

   Where provision of an anaesthesia delivery system is not essential, as in an ECT area, there must be:

   4.2.1 A breathing system capable of delivering 100% oxygen both spontaneous and controlled ventilation. An alternative breathing system should be immediately available. Where more than one patient is to be treated, this equipment must be duplicated or there must be in line viral filters. (Reference PS 28 Guidelines on Infection Control in Anaesthesia.)

   4.2.2 Adequate reserves of oxygen must be available. If a reticulated or index gas connected system is in use, an oxygen failure warning device is necessary. An emergency cylinder supply of oxygen is necessary in the event of a central supply failure.

3. A separate recovery area. The recovery area must comply with the rigorous standards for safety as specified in the ANZCA guideline as below:

ANZCA section 3.4 Recovery Area

3.4.1 Recovery from anaesthesia should take place under appropriate supervision in a designated area which conforms with ANZCA professional document PS4 Recommendations for the Post Anaesthesia Recovery Room.

3.4.2 Contingency plans should exist for the safe emergency evacuation of patients from the operating suite and or recovery areas under adequate medical supervision.

All areas should be linked with common doorways so that there can be a smooth movement from one area to the next before leaving the suite. The doors and corridors need to be wide enough to accommodate trolleys and hospital beds.

The rooms need to be large enough to accommodate the number of people who are involved in the procedure. The size may vary dependent upon the flow of patients through the service. Services with a high volume of patient care will need more space for the treatment and recovery areas than those sites that are of low volume/ occasional users.

The Australian and New Zealand Standards 2003 specifies that a treatment room should contain a stainless steel sink, drainer, and scrub-up basin. It should also comply with the *Specifications for cleaning, disinfecting and sterilising reusable medical and surgical instruments and equipment and maintenance of associated environments in health care facilities (2003).*

Space is also required for a fully equipped emergency trolley, sterile supplies, bed linen, instruments, equipment, and an area that complies with the minimum standards for the safe and proper storage of drugs including provisions for S4 and S8 drugs.

This space should have: suitable illumination, airflow and/ or air-conditioning that meet the needs for the four different areas; telephone and computer facilities to aid communication; and a duress system to obtain assistance in the event of an emergency. For more details refer to ANZCA 3.1.9

Equipment

A stand-alone ECT Suite is a unique anaesthetising location, in that:

- only a single, standardised procedure is carried out
- the duration of anaesthesia required is invariably brief
- although treatment may be urgent, it is never an emergency
- infants are not treated
- apart from intravenous injections, no invasive techniques are used
- anaesthetic technique does not involve administration of volatile agents.

Under these circumstances, the Australian and New Zealand College of Anaesthetists Guidelines should be modified.

Apart from the ECT apparatus and its accessories, which should comply with RANZCP guidelines, other necessary equipment required in a stand-alone suite include:

1. A range of intravenous cannulae, taking into account the preferences of the attending anaesthetists.

2. Monitoring apparatus capable of measuring and displaying:

   - non-invasive arterial blood pressure (NIBP)
   - oximetry
   - three-lead electrocardiography.

The device(s) must be capable of providing a print-out which is incorporated into the anaesthetic record.

3. Devices for management of the airway, including:

   - a range of oropharyngeal and nasopharyngeal airways
   - a range of laryngeal mask airways
   - a range of (cuffed) endotracheal tubes
   - a laryngoscope with adult and extra large blades
   - a flexible bougie/introducer
   - lubricant.

4. Suction accessories, including single-use catheters and handpieces.

5. Mouthguards.

6. Plastic face-masks for administering high concentrations of oxygen to spontaneously breathing patients, with or without nebulisation.

7. Gauzes, dressings and adhesive tapes.

8. Venous tourniquets.

Section 7.2 provides more information on equipment for anaesthesia.

4.4 ECT administered within a general hospital theatre

ECT administered within a general theatre is governed by the following professional legislations, guidelines and bodies:

1. RANZCP Memorandum #12.

2. ANZCA *Recommendations for minimum facilities for safe administration of anaesthesia in operating suites and other anaesthetising locations*.

3. NSW Mental Health Act 2007 & Regulations.

4. Australian Council of Operating Room Nurses.

5. Operating Theatre Association.

Legislative requirements

The MHA specifies that ECT must be administered in a hospital approved for this purpose. There are specific provisions that cover the administration of ECT within a private hospital, listed in *Private Hospitals and Day Procedure Centre Act 1998* No 123, Section 7: Licensing Standards.

Delivery of ECT

ECT should be administered within an appropriate day-only Procedure area or theatre. It is strongly recommended that it is not administered in the recovery area or other areas that lack privacy.

Patient recovery

Patients should recover in the recovery area supervised by responsible designated nursing staff as specified by the local area and other governing bodies.

All other requirements governing the practice of ECT within a general hospital should comply with the provisions specified by the relevant area health service.

4.5 ECT administered at other locations

In rare circumstances it may be necessary to administer ECT in a location other than a stand-alone ECT suite or a general hospital theatre, for example when patients have a serious physical illness that requires treatment elsewhere within a hospital. Decisions on such treatment must take account of the specific circumstances and be made in consultation with other senior clinicians involved in the patient's care.

SECTION 5

Preparing the patient for ECT

5.1 Pre-ECT work-up

History, physical examination and baseline cognitive testing

A comprehensive medical history and physical examination is the key component of a pre-ECT work up. These should focus on the neurological, cardiovascular and respiratory systems and include checking dentition and feeling the skull for defects and plates.

A baseline cognitive examination is imperative. While not ideal, the Folstein Mini Mental State Examination (or one of its variants like the Standardised MMSE or Modified MMSE) is a reasonable instrument. A more comprehensive cognitive assessment can be obtained with the Addenbrooke's Cognitive Examination (ACE-R) and, for people with limited literacy skills or for whom English is not their first language, the Rowland Universal Dementia Assessment Scale (RUDAS) is recommended.

Routine use of an instrument to rate depression, such as the Montgomery-Åsberg Depression Rating Scale (MADRS) or the Geriatric Depression Rating Scale, or general psychopathology (for example, the Clinical Global Impression Scale or Brief Psychiatric Rating Scale), before and after a course of ECT is helpful.

Investigations

Investigations routinely performed prior to ECT include a full blood count, chest X-ray, serum biochemistry and an ECG. An ECG and serum potassium test provide important information on the risk of cardiac arrhythmias that is not always available from the patient's history and examination. Other investigations, including a chest X-ray, are generally unnecessary before ECT unless clinically indicated. The use of 'screening tests' is discouraged.

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. Low potassium levels potentiate the effect of suxamethonium, possibly causing prolonged apnoea.

Dehydration increases seizure threshold and hyponatraemia predisposes to a lowered seizure threshold and increased seizure duration.

A cerebral CT is not a useful routine investigation, but should be considered when there is a clinical indication of an intracranial space-occupying lesion.

Consultation with other specialties

A pre-ECT anaesthetic consultation is mandatory. Other consultations, requested when indicated, include respiratory, cardiology, ophthalmic and neurology specialists. It is important to be specific in the questions asked of the consultant: the question should not be, 'Is it safe to give this person ECT?' As there are no absolute contradictions for ECT, a more rational approach is to ask:

- What is the person's medical/surgical/anaesthetic condition?
- What is the risk involved in giving this person a course of ECT compared to the risk of not treating with ECT?
- What interventions could be made to reduce this risk?

Many non-psychiatric consultants are unfamiliar with modern ECT practice and the physiological changes that occur during the stimulus, seizure and recovery period. It is often necessary to impart this information so the consultant can offer a more informed opinion.

5.2 Medications and ECT

The following general principles apply when reviewing medication prior to a course of ECT.

- Minimise psychotropic medications and remember that there is no point continuing an antidepressant or mood stabiliser that is not working.
- Give oral medications at their usual time, up to three hours prior to each treatment with a sip or two of water, especially medications that will make ECT safer. Such medications might include antihypertensives, steroids, anti-oesophageal reflux agents, anti-anginals and anti-arrhythmics.

- Non-oral medications, such as bronchodilators, eye drops and topical medications, should be administered as usual and not be withheld prior to treatment.
- Avoid, as far as possible, medications that will increase the risks of ECT or make it less therapeutic. Drugs which require special consideration include theophylline, diuretics, hypoglycaemics, benzodiazepines, lithium carbonate and anticonvulsants.

Antidepressants and antipsychotics

The majority of patients with a major depressive episode who respond to ECT will relapse within six months without continuation pharmacotherapy. It is standard practice to commence an antidepressant, usually from a different class to that used prior to the first ECT course. This is usually initiated during the ECT course. There have been reports of the safe use of SSRIs, tricyclic antidepressants and monoamine oxidase inhibitors with ECT.

There are reports of prolonged asystole and hypotension in patients taking venlafaxine during administration of ECT. The risks and benefits of this combination should be considered and discussed with the anaesthetist.

The use of antipsychotics during a course of ECT is common. Provided appropriate precautions are taken, it should be a safe combination. There have been several reports of the safe use of clozapine with ECT. In patients with schizophrenia, antipsychotics and ECT may have a synergistic effect.

Lithium carbonate

There are several reports of severe confusion resulting when ECT has been administered to patients taking lithium, particularly when serum levels are at the higher end of the therapeutic range. Where possible, it is advised to suspend lithium prior to an index episode 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, where there is a risk of a manic swing if lithium is withdrawn, are more complex and need careful consideration.

If the decision is to maintain the person on lithium during the ECT course, then both the evening dose prior to each ECT treatment should be omitted, and the morning dose delayed until after recovery from the treatment.

Anticonvulsant mood stabilisers

Anticonvulsants increase the seizure threshold and reduce seizure expression and duration, and may reduce the efficacy of ECT. Where possible, an anticonvulsant being used to augment an antidepressant should be withdrawn prior to the ECT course commencing.

In bipolar disorder, the clinical decision on whether or not to withdraw the anticonvulsant must consider the balance between the risk of manic relapse and the potential adverse effects on the seizure.

If the anticonvulsant is continued, then the evening dose prior to each ECT treatment should be withheld and the morning dose delayed until after recovery from the treatment.

This approach should also be taken where an anticonvulsant is being used for a seizure disorder. As ECT has a potent anticonvulsant effect, the dose of anticonvulsant may be reduced as the course proceeds.

Benzodiazepines

Use of benzodiazepines, particularly those with a longer half life, during a course of ECT may increase the seizure threshold and the risk of cognitive impairment, and reduce the seizure length and efficacy. The concurrent use of benzodiazepines may result in failure of treatment and should be avoided.

Antidiabetic medication

Depression, particularly with melancholic symptoms, can destabilise diabetic control. As depression improves through the course of ECT, the dose of diabetic medication may need to be reduced to prevent hypoglycaemic episodes. Diabetes should be monitored closely during an ECT course.

On the morning of each treatment, oral hypoglycaemics should be withheld until after treatment. For patients using insulin, it is advisable to consult an endocrinologist about management of their treatment on the morning of ECT. The patient 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 electrical stimulus and suxamethonium. In addition, they can potentiate the muscle relaxant effect of suxamethonium, particularly with rivastigmine which also inhibits butyryl cholinesterase, the enzyme which metabolises suxamethonium. There are two case reports of the safe use of donepezil and rivastigmine during ECT. The continued use of these drugs should be discussed with the anaesthetist. However, 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.

Cardiac pacemakers

Cardiac pacemakers protect against the marked changes in heart rate that usually occur with the administration of the ECT stimulus and the subsequent seizure. The patient's cardiologist and the device manufacturer should be consulted to determine whether the pacemaker needs to be switched to 'fixed rate' from 'demand mode', though this is usually unnecessary with modern devices. Case reports suggest that pacemakers do not create any special hazard.

Implanted cardiac defibrillators

Having an implanted defibrillator does not preclude a person having ECT. The patient's cardiologist and the device manufacturer should be consulted to check whether the defibrillator may be triggered by the changes in heart rate that occur with ECT, although this is most unlikely with modern devices. Older devices might need to be turned off just prior to each treatment, and then reprogrammed following the seizure.

5.3 Smoking

Patients should be strongly encouraged not to smoke on the morning of treatment. To do so will complicate recovery from anaesthesia and will also result in vasoconstriction that may impede venous access.

SECTION 6

Administration of ECT

6.1 ECT equipment

All sites where ECT is performed must be equipped with the following:

a) A modern ECT device with the following features:

   i. a constant current, bi-directional brief pulse square wave output

   ii. an EEG monitor with at least two channels of monitoring and a paper print-out

   iii. capable of delivering a charge of up to at least 1000 millicoulombs

   iv. capable of delivering a variety of stimulus parameters, including brief pulse widths, down to at least 0.3 msec

   v. a method of measuring circuit impedance

   vi. a safety mechanism for the treatment button to prevent accidental discharge

   vii. a maintenance program conducted by authorised personnel which complies with NSW Health standards for medical equipment.

b) Disposable EEG recording electrodes.

c) Treating electrodes with a minimum diameter of 5cm to avoid skin burns. These may be metal or disposable adherent electrodes.

d) Conductive gel or solution.

e) A method of measuring muscle relaxation prior to delivering the stimulus. This may be a patellar hammer for detecting the abolition of the patellar reflex or it may be an electronic nerve stimulator.

f) Cardiovascular and other monitoring equipment as specified in Section 7 (Anaesthesia).

6.2 Patient preparation

Patients are to be received calmly and courteously into the treatment area and final checks made, including identity, a confirmation that they consent to continuing treatment, and confirmation of recent voiding of urine, fasting etc. The treatment room staff are to confirm that for voluntary patients the consent form has been signed by the patient and witnessed and that for voluntary and involuntary patients the documentation is fully compliant with the *NSW Mental Health Act* and that there is a treatment order signed and dated by the patient's treating doctor.

Some of the following procedures may be done before the anaesthetic is administered. If so, all procedures are to be explained to the patient as they are performed, in a reassuring manner.

If using the isolated limb technique to monitor motor movement, the sphygmomanometer cuff should be applied to the right calf and not inflated until the anaesthetic induction agent has been given. This technique is recommended when performing a stimulus titration procedure (see below) to assist in the detection of a motor seizure, but is optional under other circumstances.

To ensure the quality of the EEG recording, the skin beneath the recording electrodes must be adequately prepared. This can be achieved using a folded gauze swab moistened with normal saline to gently but firmly clean surface oils and debris from the recording sites. An alcohol wipe is a satisfactory alternative to moistened gauze. Care must be taken on elderly skin to avoid damage.

A standardised approach for applying the EEG recording electrodes should be used so as to facilitate the comparison of EEG recordings across the course of treatment. A useful convention for 2-channel EEG recording is to apply channel 1 electrodes to the left hemisphere and channel 2 electrodes to the right hemisphere, with positive electrodes placed on the forehead and negative electrodes on the mastoid (see 6.3). The recording electrodes are to be applied as follows: the anterior electrodes are placed on

the forehead, 2.5cm above the midpoint of the eyebrow (mid-pupillary line), except when bifrontal treatments are being given, in which case the anterior recording electrodes are moved medially, either side of the midline (see below); the posterior recording electrodes are placed over the mastoid process, over bone, high enough to avoid being placed over the sternomastoid muscle – this will avoid both muscle artefact and any cardiac artefact that is transmitted along the carotid artery.

The skin beneath the treating electrodes is to be prepared in the same way as described above for the recording electrodes. The use of abrasive materials to clean the skin is not recommended because of the possibility of electrical burns occurring following overly zealous cleaning.

6.3 Treating electrodes

Depending on the technique used, the treating electrodes may be applied either before the anaesthetic is administered (with appropriate reassurance to the patient) or afterwards. Acceptable techniques are:

1. metal electrodes secured by a rubber headband

2. metal electrodes attached to hand-held electrodes

3. disposable adherent non-metal electrodes

4. a combination of the above

To ensure low impedance at the skin-electrode interface and to avoid skin burns, the electrodes must be 5cm in diameter and adequate conducting gel must be applied between the electrode and the skin. If using disposable adherent electrodes, it may be necessary to apply a small amount of conducting solution or gel to reduce the impedance to acceptable levels. Care must be taken to ensure firm contact with the skin with all types of electrodes and techniques to ensure low impedance and to avoid skin burns. It is essential when using metal electrodes to use a flat electrode on a flat surface (i.e. temporal placement) and a concave electrode on a rounded surface (i.e. vertex and bifrontal placements) otherwise burns may occur.

6.4 Electrode placement

There are three types of electrode placement which can be used, depending on individual patient circumstances:

1. Unilateral placement

   This is the preferred placement for most patients. The available evidence suggests that provided that the dose is at least 3 times threshold, the efficacy of unilateral ECT is acceptable and is associated with less cognitive impairment than bitemporal placement. The evidence suggests that at dosage levels approaching 6 times threshold, the efficacy is increased and may equal the efficacy of bitemporal ECT, though at very high doses the cognitive side-effect advantage may be diminished. More recent studies indicate that the cognitive effects of very high dose unilateral ECT are reduced by utilising a very brief pulse width (0.3 msec) though efficacy may be reduced – this is still under investigation (see below).

2. Bilateral (bitemporal) Placement

   Bitemporal placement is generally regarded as the most effective form of ECT, but it is also associated with the greatest degree of cognitive impairment, particularly retrograde memory loss, which may not be fully reversible. Its use should be restricted to situations where other electrode placements have been ineffective, or when there is some urgency to achieve a rapid response (e.g. in a life-threatening situation) or when the patient's history indicates a previous poor response to unilateral ECT and a good response to bitemporal ECT. For bitemporal ECT the effective dose is 50-100% above threshold. Doses higher than this may produce excessive cognitive side-effects and should only be considered where an urgent clinical response is needed or where the treatment response is inadequate at the lower dosage.

3. Bifrontal placement

   Bifrontal placement has not been as well studied as the other electrode placements, but the available evidence suggests that its efficacy may be approximately equal to that of bitemporal ECT, but with less cognitive impairment. Further research is needed to establish its therapeutic role, but individual patients may well benefit from using this electrode placement. For example, a patient who has not responded to unilateral ECT, who

has been switched to bitemporal ECT and is having unacceptable cognitive side-effects may well achieve recovery with bifrontal placement and with less cognitive problems. When using bifrontal ECT, accurate placement of the electrodes is important to ensure low seizure thresholds.

Electrode placement – recommendations

1. For most patients, unilateral placement at a dose of 3-6 times seizure threshold is the preferred choice, except when bitemporal placement is indicated (see above). If after 6 treatments of an adequate dose, there is an inadequate response, then options are as follows:

    a) Dose relative to seizure threshold may be increased (especially if initial dosing was at 3 times seizure threshold). Note that some patients may not respond to treatment with unilateral ECT and will require a switch to bilateral ECT.

    b) Electrode placement should be changed to bitemporal ECT, or, if there is concern about excessive cognitive impairment with bitemporal placement, bifrontal placement should be considered. Given that a high proportion of left-handed people have either left-sided or bilateral cerebral dominance, right unilateral should be used initially. If this is associated with an unusual degree of cognitive impairment, especially early in the treatment course, the electrode position should be changed to either left unilateral or alternatively bifrontal placement, thereby avoiding stimulation of both temporal lobes.

2. If, after switching from unilateral to bitemporal placement there is excessive cognitive impairment, it is not appropriate to return to unilateral treatment as it has already proven to be ineffective. Reducing the frequency of ECT sessions (for example, from three times weekly to twice weekly) or switching to bifrontal ECT is an option in this situation.

Electrode placement – positions

1. Right unilateral ECT

    The correct position is the D'Elia position (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. Note that the vertex is not the crown, which is more posterior. 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.

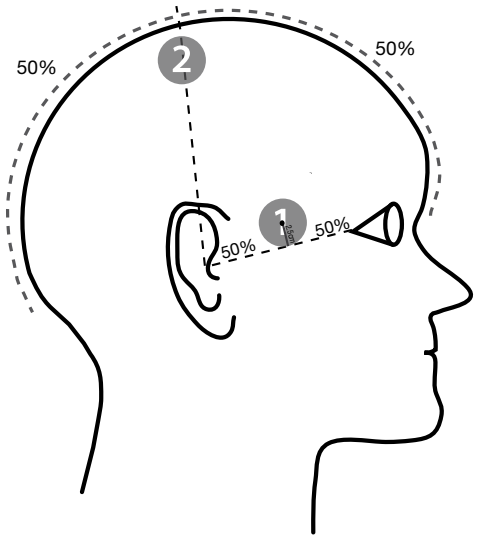
2. Bilateral (bitemporal) Placement

    Each electrode (flat) is placed in the temporal fossa bilaterally, as for the unilateral placement.

3. Bifrontal ECT

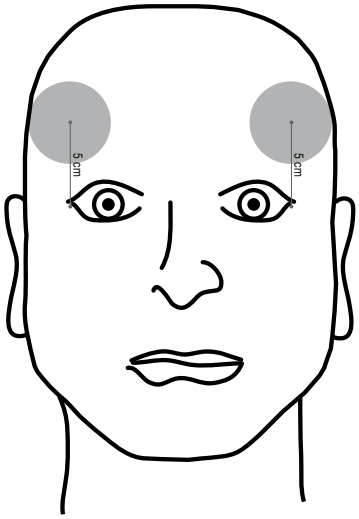
    The anterior EEG recording electrodes should be moved medially, to approximately 1cm either side of the midline, to allow room for placement of the treating electrodes. Concave metal electrodes or adherent disposable electrodes are to be used. The midpoint of each treating electrode is placed 5cm above the outer canthus of the each eye, in a parasagittal plane (Figure 2). Correct placement is essential to avoid high seizure thresholds and missed seizures. It is recommended that the correct site is identified by measuring the distance above the outer canthus rather than estimating the distance. A small mark made with a washable marker can be placed at the correct site to guide the electrode placement. Care must be taken to avoid any contact between the treating electrodes and the EEG recording electrodes, and that there is no excess conductive gel creating a short circuit of the current across the forehead. Note that skin burns may occur if the electrodes are placed too closely together.

Figure 1: Recommended placement of treatment electrodes: bilateral and unilateral placement



(Adapted from The Practice of Electroconvulsive Therapy: Recommendations for Treatment, Training, and Privileging: A Task Force Report of the American Psychiatric Association. 2nd Edition, 2001)

Figure 2: Recommended placement of treatment electrodes: bifrontal placement



6.5 Dosage

It is now well established that for ECT to be effective, the electric charge must be at least 3 times above seizure threshold for unilateral ECT and 1.5 times threshold for bitemporal ECT. The required dosage above threshold for bifrontal ECT has not been established but it appears to be similar to bitemporal ECT. In particular, it has been shown that for unilateral ECT, doses close to threshold are ineffective. This means that in order to be sure that a patient is receiving an adequate dose, the patient's seizure threshold needs to be known. Therefore, the preferred technique is to establish the individual seizure threshold by titration at the first session (see attached titration schedule at Appendix 5), with subsequent treatments being given at above threshold doses (at least 3 times for unilateral and 1.5 times for bitemporal and bifrontal placements). The main disadvantage of the titration procedure is that the patient will usually receive one, two or three subconvulsive stimuli, with the risk of profound bradycardia or even asystole. This can be prevented by pre-medication with atropine.

The other generally accepted method of dosing is a fixed dose for all patients, regardless of individual thresholds. This is a simpler technique, which may be more suitable than the titration technique in some facilities. One approach is to calculate the dose according to the age of the patient that is, the dose (percentage of output, where 100% = approximately 500mC) is set to the patient's age (unilateral) or half the patient's age (bilateral). The main disadvantage of this approach is that it is not possible to know the patient's seizure threshold and therefore to know that the dose is sufficiently above threshold to ensure adequate efficacy, especially for unilateral ECT.

Dosage increases during treatment

For most patients, during a course of ECT the seizure threshold rises at a rate which varies considerably between individuals. In order to ensure that the dose remains adequately supra-threshold, it is usually necessary to increase the dose during the course. The decision to increase the dose is based on changes in the quality of the EEG during the course. As the threshold rises, continuing with the same dose means that treatment is occurring at a lower dose relative to threshold and the EEG quality deteriorates. This is the signal to increase the dose according to the dosage table as per Appendix 5. Prior to each treatment, it is necessary for the ECT practitioner to examine the previous EEG tracings in order to detect changes in the quality and to therefore adjust the dose. Note that ictal EEG appearances can vary considerably between individuals. Older patients, in particular, may have ictal EEGs of poor quality, even at high supra-threshold doses.

The decision to increase the dose may also be based on an assessment of the patient's clinical progress, independent of or in conjunction with the EEG morphology. This may be the preferred method in those situations where EEG morphology is poor despite dose increases or is otherwise unreliable as an indicator of dose adjustments because of poor morphology.

Pulse width

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

The most commonly recommended standard pulse width for all electrode placements has traditionally been 1msec and most published efficacy studies have utilised 1msec or higher. More recent studies have examined ultra-brief pulse widths of 0.3 msec and have demonstrated that for unilateral ECT, the associated cognitive impairment is significantly reduced compared to 1msec pulse widths . Efficacy outcomes are less consistent between studies (Sackeim et al, 2008; Loo et al, 2007; Loo et al, 2008; Sienaert et al, in press) – whether there is some loss of efficacy needs to be clarified with further research. For bilateral placements the studies have been less conclusive. One study of bitemporal ultra-brief pulse width ECT showed reduced efficacy compared with 1 ms pulse width stimulation, while another study of bifrontal ultra-brief ECT suggested clinically meaningful efficacy. Until further studies are available, ultra-brief bitemporal and bifrontal ECT should not be used routinely.

If unilateral ultra-brief ECT is to be used it is recommended that the electrical dosage is at least six times seizure threshold. A titration procedure will be necessary to enable accurate calculation of the supra-threshold dose and it is necessary to ensure that the ECT device can deliver small dosage increments in the low dose range, e.g. for the Thymatron device the programme needs to be adapted to allow dosage increments of 1% intervals between 1% and 10%. This is because, unlike 1msec pulse width, the seizure threshold with ultra-brief unilateral ECT is generally very low, e.g. 10-20 millicoulomb (2-4% in the Thymatron system).

Some units have used a pulse width of 0.5 msec as standard for all electrode placements and it is noted that the manufacturers of the Thymatron Series 4 device recommend that the 0.5 msec pulse width programme be used for all patients. There are no published ECT efficacy studies that have evaluated ECT given at 0.5 msec pulse width so there are no data available to indicate the efficacy and side effect profile of 0.5 msec pulse width ECT relative to other pulse widths.

Spacing of treatments

ECT is usually given two or three times per week in an acute treatment course. These treatments should be spaced as evenly as possible across the week. The literature on the relative benefits of twice versus three weekly treatments suggests that the total number of treatments required is less with twice weekly ECT, but that the duration of the treatment course may be slightly longer (for review see Loo et al, in press). In 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, slowing ECT sessions to twice weekly is often beneficial.

6.6 Clinical monitoring over the treatment course

The effects of ECT on psychiatric symptoms (such as mood and psychotic symptoms) and side-effects (both cognitive and non-cognitive) should be carefully monitored over the ECT treatment course, to allow adjustments of treatment as necessary, and objective assessment of outcomes. As well as frequent clinical assessments (at least twice per week during an acute course of ECT), the use of structured rating scales is recommended, administered prior to commencing ECT and at the end of the treatment course.

6.7 The procedure

The ECT practitioner should greet the patient and provide reassurance. The treatment orders, including electrode placement and dose are to be checked and the EEG recordings from previous treatments are to be examined to determine whether a dosage increase is required. The dose should then be set on the machine.

Before the patient is anaesthetised, there is to be 'time out' during which the NSW Health policy (PD 2007_079) 'Correct patient, Correct procedure, Correct site' is to be observed. In the case of ECT the check needs to be 'Correct patient, Correct *electrode placement*, Correct *dosage*'. This checking process is to be conducted jointly and simultaneously by the ECT practitioner and the ECT nurse

and is to be countersigned by both. The anaesthetic can then be given. If using the isolated limb technique to monitor motor seizure, the cuff should be inflated to 40% above systolic blood pressure just prior to the administration of the muscle relaxant. If the recording and treating electrodes are not already in place, they should now be attached and the following procedures observed:

1. The anaesthetist inserts the mouthguard.

2. 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:

    a) Ensure that the treatment cable is connected to the treatment electrodes and to the ECT device.

    b) Ensure that the electrodes are firmly against the skin and that there is sufficient conductive gel – add more gel if needed.

    c) 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.

    If the impedance cannot be reduced below the machine's maximum limit, if using the MECTA device the machine will not discharge and treatment cannot proceed. 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. Generally it is better to proceed with treatment rather than abandon the procedure.

3. Check with the anaesthetist that the patient is fully anaesthetised and that adequate muscle relaxation has been achieved. If so, proceed with treatment by lifting the safety guard and pressing the treatment button, which then needs to be held until the discharge is complete.

4. The duration of both motor and EEG seizure are to be observed and recorded. The quality of the EEG seizure should also be recorded and compared with previous tracings so as to assist in guiding the dose for the next treatment.

5. If a titration procedure is being performed, the initial dose should be as determined by the titration chart which is appropriate for the pulse width program being used (attached at Appendix 5). If a seizure (defined as a generalised motor seizure or definite EEG seizure of any length or quality, with or without visible motor seizure) is not elicited then the dose should be increased by one level as indicated on the chart and the patient re-stimulated. This should be repeated until a seizure is elicited, provided that no more than four stimuli are delivered at one session and that there are no anaesthetic or medical issues which would place the patient at unreasonable risk by continuing. A stimulus which has failed to elicit a seizure can be followed by a repeat stimulus without delay, as there will be no refractory period unless there has been a seizure.

    If a threshold seizure is elicited at the first, second or third stimulus, a further treatment stimulus at the appropriate supra-threshold dose may be given depending on the risk-benefit analysis, taking into account the severity of the patient's psychiatric condition, co-morbid medical issues and the anaesthetist's assessment of the patient's suitability to proceed. Generally, re-stimulation at a supra-threshold dose within the titration session is more critical for unilateral than bilateral ECT. If a treatment stimulus is to be given, a period of 60 – 90 seconds delay is required between stimuli to prevent re-stimulation during the post-seizure refractory period.

6. In the case of a missed seizure (except during a titration procedure) the dose should be increased by one level and the patient immediately re-stimulated. The operator should also check that the electrode placement is correct, particularly for bifrontal placement. If the seizure is again missed, the treatment session should end and prior to the next scheduled treatment the patient should be assessed for potential causes of the missed seizure, such as the inappropriate administration of anti-convulsant drugs.

7. If a patient has repeated missed seizure or persistently poor quality EEG recordings despite adequate dose increases, then consideration should be given to employing methods to enhance seizure production, such as hyper-ventilation, changing the type or dose of the anaesthetic agent, or augmenting the anaesthetic with remifentanil in order to further reduce the dose of the main anaesthetic induction agent. The use of augmentation

strategies such as theophylline or caffeine is not recommended because of medical risk.

8. In the case of a prolonged seizure (greater than 180 seconds) the seizure should be terminated by the anaesthetist, using an appropriate pharmacological intervention. In the rare instance that this fails to terminate the seizure, the appropriate management is to re-stimulate the patient at a higher electrical dose.

   Prior to the next scheduled session, the patient's neurological status and medical history as well as the current medications should be reviewed to eliminate any potential cause for a prolonged seizure. It should be noted that healthy young patients will sometimes have prolonged seizures.

   If a patient has more than one prolonged seizure, then treatment should be suspended until there has been a thorough neurological review.

   Provided that no neurological or other cause has been found, the correct procedure at the following treatment session is to increase the dose by one level and continue treatment. The higher dose is most likely to prevent a prolonged seizure, as the most common cause of prolonged seizure is the generation of a threshold seizure. It is not appropriate to reduce the dose in subsequent treatments as this may produce a missed seizure, another prolonged seizure, or may lack efficacy.

6.8 Information for patients

Examples of information that might be given to patients about ECT treatment (regarding pre and post treatment care) are provided in Appendix 1 and Appendix 2.

6.9 Records

The patient's medical records must include:

- continuing patient consent to treatment (Information and Consent Form ECT [MHA 2007 Sections 91, 93 & 96])
- results of an appropriately comprehensive physical examination, investigations and/or anaesthetic review
- any side-effects resulting from ECT
- results of any cognitive testing.

6.10 Post-ECT follow-up and monitoring

Following the end of the treatment course and discharge from hospital it is recommended that the patient be monitored regularly by a psychiatrist or community treatment team in conjunction with the general practitioner for a minimum of six months. The patient should be monitored for any return of symptoms in order to detect any relapse of illness at an early stage. The progress of any ECT-related cognitive impairment should also be monitored.

The inpatient treatment team should ensure that, at the time of discharge, the follow-up clinicians are informed of the patient's response to treatment, the presence of any persisting symptoms of illness, an assessment of any ECT-related cognitive impairment and the post-ECT management plan. In the case of adolescent patients, monitoring should also include ongoing assessment of academic performance.

6.11 References

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SECTION 7

Anaesthesia for ECT

General anaesthesia and the introduction of short-acting muscle relaxants has transformed the practice of ECT. An important role of the anaesthetist is to assure the patient and their carers that the patient will be completely unconscious before the treatment is administered. Anaesthesia is remarkably safe and ensures that ECT is not an unpleasant experience. There has not been a death from anaesthesia for ECT in New South Wales for more than 25 years. And the deaths that did occur prior to this were the result of inadequate medical training and supervision as well as a lack of guidelines and standards for the performance of anaesthesia for ECT.

7.1 Staffing the anaesthesia service

The anaesthetic service for ECT must be under the direction of a qualified consultant anaesthetist with extensive relevant experience. The number of participating anaesthetists may vary, but every effort should be made to ensure regular attendance and avoid *ad hoc* rostering. Where trainees are involved they must be supervised at a level consistent with their experience; exposure to a significant number of sessions is necessary if they are to acquire the knowledge and skills specific to ECT.

Prior to delivery of the ECT stimulus, nursing assistance to the anaesthetist can be adequately provided by the nurse present in the treatment area, provided that this person has been carefully instructed. Prior experience in an operating suite or intensive care unit is ideal but not mandatory. A somewhat higher level of skills is required for nursing staff in the recovery area (see below at Section 11).

7.2 Equipment

An ECT facility does not require apparatus that is capable of delivering volatile anaesthetic agents nor certain expensive monitoring devices.

The ANZCA has guidelines on the equipment required for anaesthetising locations other than the operating suite which are useful. However, minimal requirements are:

- A reliable source of oxygen, which can be provided adequately by cylinders of appropriate capacity (D or E size) and in numbers sufficient to ensure reserves. Even where reticulated gases exist, a standby cylinder supply is essential. All cylinders must be effectively secured against accidental toppling.
- A breathing system which can deliver 100% oxygen both to a spontaneously breathing patient, as well as enabling controlled ventilation when required.
- A back-up device in the event of failure of the above apparatus. For this purpose a self-inflating bag-type resuscitator is adequate, but such devices should be used only in an emergency.
- Devices to manage the airway as required, ranging from oro- and naso- pharyngeal items through laryngeal mask airways to endotracheal tubes and the means of their introduction.
- A monitoring apparatus capable of measuring and displaying arterial oxygen saturation, electrocardiography and non-invasive arterial blood pressure.
- 'First-line' emergency drugs, the nature of which is undergoing constant revision. The opinion of the Consultant responsible for the treatment should be sought. 'Second-line' drugs – those required subsequent to crisis – are neither necessary nor appropriate in an ECT suite. This is because long-term management of the ECT patient must entail accommodation in an ICU or high dependency environment where these drugs can then be prescribed as required.

7.3 The pre-anaesthetic examination

The patient scheduled for ECT should have had an admission history and physical examination performed by medical staff, but this does not exempt the anaesthetist from eliciting a further relevant history and performing a specific physical examination. These are well described in ANZCA's guideline, *the pre-anaesthetic consultation*.

Particular attention needs to be paid to previous experience of anaesthesia, oral health and the presence of any dental prostheses. Patients who have prostheses which may be at

risk during the procedure need to be warned of possible damage to these items.

Detailed examination of the venous system is useful, since there will be a need for repeated venepuncture over a period of days and weeks. Rotation of sites may be desirable.

Above all, the pre-treatment visit by an anaesthetist is a valuable tool in relieving anxiety, especially as there are clinical reasons to avoid the use of pre-medication.

7.4 Fasting

Fasting prior to ECT needs to be of sufficient duration to ensure minimal gastric residue, but excessive deprivation of fluids is to be deplored. The common routine of 'nil by mouth after midnight' is simplistic and often results in no intake after 9 pm. For the last patient on a long list, this means intolerable deprivation for over 12 hours. Dehydration to this extent leads to reduced venous access and impaired circulatory compensation mechanisms.

Current standards of care require 'solid' food to be withheld for a minimum of six hours, but 'clear' fluids are permissible for up to four hours pre-treatment. Patients who are awake at any time up to this hour should be encouraged to drink appropriate fluids.

Occasionally a reluctant patient may breach fasting discipline to avoid being treated, but treatment can often be rescheduled later in the day.

7.5 Pre-medication

Benzodiazepines and barbiturates are contraindicated before ECT because of their anticonvulsant effects, and opiates are undesirable in the psychiatric environment. Some other psychotropic medications such as chlorpromazine, given as pre-medication rather than as part of continuing treatment, are relatively contraindicated before general anaesthesia.

Patients' anxiety can be significantly reduced by a visit on the previous day by the anaesthetist, and by familiarising the patient to the environment beforehand. Waiting time should be kept to a minimum, so that long lists should be avoided. Some ECT facilities have overcome this difficulty by scheduling half their patients on Mondays, Wednesdays and Fridays, and the remainder on Tuesdays, Thursdays and Saturdays.

7.6 The anaesthetic

The principles for general anaesthesia in ECT are the same as those for any procedure:

- to render the patient oblivious to the procedure and any aspects of the anaesthetic technique which would be distressing
- to protect the patient from injury resulting from the unconscious state or the procedure being performed
- to maintain physiological stability throughout the anaesthetic and until its effects have dissipated
- to collaborate with the operator (in this case the psychiatrist) to ensure an optimal outcome for the patient.

How these objectives are achieved is up to the anaesthetist but pre-oxygenation is an essential part of the technique, as is an induction which will ensure that the patient is unaware of the onset of muscle relaxation and of the passage of the stimulus.

The degree of muscle relaxation must be sufficient to minimise the motor component of the seizure, as well as reducing demands on the myocardium for increased cardiac output. The muscle relaxant of choice is suxamethonium, despite the misgivings of some anaesthetists. The track record of this drug in ECT is one of remarkable safety.

It is important to appreciate that circulation time is prolonged in severe depression and in elderly patients, so adequate time must be provided to await the full effect of the induction agent and the muscle relaxant before allowing the stimulus to be applied.

7.7 Protecting the teeth

The temporal muscles are directly stimulated by the passage of the current in both bilateral and unilateral electrode applications. The muscle relaxant cannot abolish the resulting jaw clench since it only acts at the neuromuscular junction. Hence an effective mouthguard is essential.

It is dangerous for a Guedel airway to be in place while the stimulus is applied since it concentrates the force of jaw clench over a limited number of anterior teeth. An effective

mouthguard must distribute most of the load over the posterior teeth, which are better able to cope with such force.

Supporting the chin ensures that the teeth are in contact with the mouthguard as the stimulus is applied.

7.8 Monitoring

Oximetry and non-invasive arterial blood pressure recording are mandatory; ECG is optional if there is no pre-existing cardiac pathology, although some anaesthetists prefer to use it routinely. To obtain a satisfactory trace, some disturbance of the patient's clothing is necessary.

Monitoring should continue throughout the seizure, as well as during recovery.

7.9 Recovery

Recovery from the usual anaesthetic given for ECT would normally be quite prompt, but post-ictal impairment of consciousness prolongs the recovery process. It may take up to 20 minutes before the patient responds to commands.

Administration of oxygen by a simple plastic re-breathing type mask can be discontinued as soon as the patient is able to converse, but continued oximetry is essential until saturation is satisfactory while breathing room air. A fall in saturation below 90% requires intervention.

Arterial blood pressure measurement and recording at 15 minute intervals during recovery is normal practice.

Discharge from recovery can occur as soon as the patient can stand unsupported. Transport back to the ward by wheelchair – or by bed or trolley if needed – is preferable.

7.10 Drug interactions and regular medications

Relevant drug interactions and the use of regular medications at the time of ECT are described in detail in Section 5.2.

7.11 Complications

Management of short-term complications occurring while the patient is still in the ECT suite is the responsibility of the anaesthetist.

The homozygous pseudocholinesterase deficiency which results in prolonged paralysis from suxamethonium (up to 2 hours) is rare, although some heterozygotes may suffer delayed recovery for 10-15 minutes. In either case, there is no danger provided that oxygenation is maintained. However, if paralysis persists beyond the return of awareness, steps need to be taken to protect the patient from a potentially frightening experience.

There are no case reports of malignant hyperpyrexia (MH) following the use of suxamethonium for ECT. There is a potential risk, so the availability of a suitable supply of dantrolene is legally mandatory despite its expense. Expired supplies can be usefully donated to simulation facilities.

The most common and serious complication is an acute hypertensive event. Arterial blood pressure normally rises after ECT, but then rapidly subsides and rarely reaches dangerous levels. However, in patients with poorly controlled hypertension the spike can be extreme and last longer with risks to the myocardium or the cerebral arterial tree. Labetalol or hydralazine can be used to terminate persistent hypertension.

Post-ictal agitation is uncommon, and can pose risks to the staff as well as the patient. Midazolam is invariably effective in these circumstances.

Prolonged seizures are even rarer. Although EEG evidence of seizure is not as serious as prolonged motor activity, a benchmark of 180 seconds is usually advocated as being an indication for terminating abnormal cerebral activity. Midazolam may work, but thiopentone is even more effective. Any decision to repeat stimulation should be made in consultation between the psychiatrist and anaesthetist.

In the medium term, muscle pain arising from the administration of suxamethonium is not inevitable, especially if the patient is advised not to exercise vigorously following ECT. Minor analgesics such as paracetamol are effective. The problem rarely recurs after the second or following treatments, but if troublesome, pre-treatment with a small dose of non-depolarising relaxant will usually prevent recurrence.

Dental damage should be avoided with suitable mouthguards, but in rare cases a tooth is dislodged and must be urgently retrieved.

7.12 Administration

The anaesthetist should assume responsibility for progressing the list, and should consult with other members of the ECT team on the sequence in which patients are treated.

The Consultant responsible for the anaesthetic service should be a member of the ECT Committee and report any morbidity to that Committee.

Anaesthetists should promote, and co-operate with, research projects on ECT.

SECTION 8

ECT in children and adolescents

8.1 History

ECT in young people was first reported in the early 1940s. It became a popular treatment for mental illness in this age group, largely because few other effective treatments were available, but its use then diminished to become a controversial treatment of last resort in most countries. Reasons for its declining use included apprehension about potential (but unproven) harmful effects on the developing brain, the advent of effective psychotropic drugs, and negative media portrayals.

In the 1990s, there were renewed efforts to delineate the indications for ECT in young people and the way the treatment should be administered. For example, the American Psychiatric Association, Royal College of Psychiatrists, and RANZCP specifically discussed the issue in their ECT guidelines. In 2004, the American Academy of Child and Adolescent Psychiatry (AACAP) published a 'Practice Parameter' for ECT in adolescents.

8.2 Effectiveness and indications

There have been no controlled trials of ECT in children or adolescents. A comprehensive review in 1997 (Rey and Walter, 1997) examined 60 reports and highlighted that the overall quality of studies was poor, but more recent studies have been of better quality. There has been no suggestion that, across the range of disorders, the effectiveness of ECT in adolescents differs from that in adults.

Indications for ECT in adolescents are:

i) The presence of major depression (with or without psychotic features), mania, schizoaffective disorder, catatonia, schizophrenia or neuroleptic malignant syndrome.
AND

ii) The presence of symptoms serious and disabling enough to threaten the patient's life (for example, refusal to eat or drink, or high and unrelenting suicide risk) or to cause persistent and grave disability.
AND/ OR

iii) An illness that is resistant to other treatment or where the patient is unable to tolerate medication due to serious side-effects.

8.4 Consent

Under the Mental Health Act, the same rules for consent to ECT treatment applies to children under the age of 18 as they do to adults. This means that if the child is a voluntary patient, the child must give informed consent before the ECT can be performed (for the general consent requirements in relation to ECT see Part 3.3). If the child lacks the capacity to consent and is a voluntary patient, ECT cannot be administered while the child is a voluntary patient. If the child is an involuntary patient, ECT can only be administered in accordance with an ECT determination made by the Tribunal following an ECT Administration Inquiry (see Part 3.3). Parents cannot consent to ECT being performed on their child.

8.5 Adverse events

Adverse events occurring with ECT in young people are mostly mild and transient and in general are similar in type and frequency to those described in adults, except that the rate of prolonged seizures may be higher than in adults. There have been no fatalities in children or adolescents attributable to ECT.

8.6 Procedural aspects

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:

1. All young patients require a comprehensive psychiatric assessment, including a psychiatric diagnosis according to a major classification system such as DSM-IV or ICD-10. A structured diagnostic interview is sometimes helpful. A specialist child and adolescent psychiatrist should either conduct the assessment, or be consulted in cases where direct assessment of the patient is not possible (for example, in some rural areas).

2. All patients require a comprehensive medical assessment. There are no absolute medical contraindications to ECT in young people.

3. Consent must be carefully addressed. Every effort should be made to explain the procedure clearly to the young people and their families, including the benefits and risks, with due attention to the patient's age.

4. The need for concurrent medication during the ECT course should be ascertained on a case-by-case basis.

5. The seizure threshold for adolescents is often lower than that in adults.

6. The site of electrode placement and frequency of ECT treatment are as for adults.

7. 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.

8. Improvement and side-effects should be monitored by regular clinical assessment, patient self-report and weekly use of subjective and objective symptom rating scales.

9. Adolescents will almost always require medication and/or psychosocial treatments following the ECT treatment course, in order to maintain improvement and prevent relapse. 'Maintenance ECT' may occasionally be needed when the initial improvement is not maintained, but there is little data about this approach in adolescents.

8.7 Patient and parent attitudes

Studies in Australia (Walter and Rey, 2003) and France have found that most patients who receive ECT in adolescence, and their parents, view the treatment positively. Patients would have the treatment again, if indicated, and would recommend it to others. The overwhelming majority of patients and parents rated the illness as worse than ECT or medication.

8.8 References

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SECTION 9

Continuation, maintenance and outpatient ECT

ECT is a highly effective treatment, particularly for depression. However, the risk of immediate relapse after an acute course of treatment is high if ECT treatment is stopped abruptly in the absence of overlap with prophylactic treatment, such as medication. Generally, prophylactic psychotropic medication should be introduced prior to the end of the acute course of ECT. Some patients may also require continuation and maintenance ECT to prevent relapse.

9.1 Continuation and maintenance ECT

Continuation ECT (C-ECT) is defined as treatment administered following a successful course of ECT, weekly up to monthly, for up to six months after remission from acute illness is achieved. It aims to prevent *relapse* of symptoms, and is sometimes administered at the same time as medication until it is apparent that medication will provide effective prophylaxis. If patients stay well during this phase, the period of time between treatments should be extended as much as possible.

Maintenance ECT (M-ECT) is administered at weekly to monthly intervals (and occasionally less frequently) more than six months after treatment of the acute illness. The objective is to prevent another episode or *recurrence* of illness.

Both C-ECT and M-ECT are generally administered as *outpatient treatment*. When the entire course of ECT (acute treatment with or without continuation or maintenance ECT) is completed as an outpatient, the treatment is referred to as *ambulatory ECT*.

9.2 Outpatient ECT

A number of criteria should be satisfied before patients are offered ECT as outpatients.

The treating clinicians should be confident that the patient:

- will not drive or do anything else hazardous on the day of treatment.
- is under the continuing care of a psychiatrist who is reviewing their progress at an appropriate frequency, prescribing their treatment, and ensuring legal requirements have been complied with.
- can be at the appropriate section of the hospital where ECT is to be administered before the scheduled time of treatment.
- will reliably fast for a specified duration (for example, eight hours) before the scheduled time of treatment and administration of the anaesthetic.
- if required, will take essential medication (for example, anti-arrhythmic and antihypertensive medication) at the usual time with only a sip of water.
- will have a reliable person to take them home four hours after treatment and supervise them (and, for some patients, also supervise and organise transport to the hospital before treatment).

In addition, the patient should be well enough to be managed in the community setting (for example, not agitated or psychotic), should not be suicidal, and will maintain adequate nutrition except for the prescribed pre-treatment period of fasting.

9.3 Indications for continuation and maintenance ECT

Factors suggesting a patient will benefit from continuation or maintenance ECT include the following:

- *Response to ECT during the initial course of treatment*. A clear and substantial benefit from a previous course of optimally-administered ECT is a prerequisite.
- *Illness acuity*. Because of the limited availability of ECT, its cost and the potential for adverse events associated with ECT and anaesthesia, continuation and maintenance ECT should generally be reserved for individuals with a history of frequent recurrent episodes of severe illness.
- *Resistance to alternative maintenance medication*. Candidates for continuation or maintenance ECT are likely to have a history of frequent relapse or recurrence despite having taken appropriate medications at adequate doses for an adequate duration.

- *Intolerance of alternative treatments*. It may be impossible to maintain treatment with sufficient doses of multiple medications for sufficient time to provide adequate prophylaxis against further episodes of illness.
- *Patient preference*. Some patients may choose continuation or maintenance ECT over other therapeutic approaches, in order to prevent relapse or remission.

Specific indications for continuation or maintenance ECT include the following:

- *Recurrent depression*. Medications which may provide an alternative to ECT include a combination of nortriptyline and lithium.
- *Bipolar disorder*. Continuation or maintenance ECT may be effective, especially in patients with rapid-cycling bipolar disorder. Concurrent medications, including lithium, valproate, carbamazepine and antipsychotics (including clozapine) are generally well tolerated in combination with ECT, and may potentiate its effects, but they should be withheld for 12 hours before each ECT session. More frequent sessions of ECT may be required, compared to other indications, with inter-treatment intervals as short as one to three weeks. Mood switches can occur with ECT, at a rate similar to that experienced with antidepressant medication, but concurrent treatment with lithium may reduce the risk.
- *Treatment-resistant schizophrenia*. Maintenance ECT is often required to sustain an initial response in patients with schizophrenia that is resistant to medical therapy. Many case reports have described the co-administration of clozapine and maintenance ECT: most have been positive, but have been limited in the duration of follow-up, and there is not yet a solid evidence base on the efficacy of maintenance ECT for this indication. In general, maintenance ECT should be considered only after options for antipsychotic medication have been fully explored, and administered in combination with an antipsychotic medication. Objective measures of illness may be helpful to establishing the benefit of ECT.
- *Parkinson's disease.* Case reports and small case series suggest maintenance ECT is useful in patients with Parkinson's disease, either with or without comorbid depression or psychosis, who are refractory to medical therapy.

9.4 ECT schedule and administration

The specific timing and frequency of continuation and maintenance ECT treatments is controversial. An important aim is to extend the inter-treatment interval and minimise the cumulative number of ECT treatments in order to reduce the risk of cognitive side-effects. Several approaches are acceptable:

- *Fast transition.* One approach is to make a relatively fast transition from the end of the index course of treatments administered weekly, to monthly treatments. The first maintenance treatment is given one week after completion of the index course, the second two weeks after the first, the third three weeks after the second, and then monthly.
- *Slow transition*. The largest clinical trial of continuation ECT, undertaken by the Consortium for Research on ECT (CORE) group in the United States used a slow transition method (Kellner et al, 2006). Continuation ECT was administered weekly for four weeks, every two weeks for two months, and monthly thereafter.

Adhering rigidly to a pre-defined transition schedule may sometimes be problematic. For example, aggressively pursuing an inter-treatment interval of one month in a rapid transition schedule may result in relapse, particularly in patients with rapid-cycling bipolar disorder or depressive illness and a history of early relapse after ECT. Firm adherence to a slow transition schedule may also be less than optimal for some patients, especially if symptoms suggest a relapse or the persistence of a manic switch in patients with bipolar disorder. The schedule should also be reviewed if a patient is making good clinical progress but experiencing adverse side-effects of ECT. A flexible approach is therefore, recommended, with treatment schedules adjusted as needed in response to frequent review of the benefits of ECT, possible breakthrough symptoms, and careful assessment for adverse effects. Flexible continuation ECT is currently being investigated by the CORE group, applying 'symptom-titrated algorithm-based longitudinal ECT (STABLE) (Lisanby, 2008).

9.5 Cognitive side-effects of continuation or maintenance ECT

Existing evidence suggests that Mini-Mental State Examination (MMSE) scores remain unchanged or are increased during continuation or maintenance ECT. However, neuropsychological testing of 11 patients having maintenance ECT for an average of three years for the treatment of depression, with an average of almost two months between treatments, identified deficits in learning and frontal function compared to controls (Rami-Gonzalez, 2003).

Patients receiving continuation or maintenance ECT should have regular cognitive assessment with a standardised screening instrument such as the Modified Mini-Mental State Examination (3MSE), Rowland Universal Dementia Assessment Scale (RUDAS) or Addenbrooke's Cognitive Evaluation – Revised (ACE-R). This should occur at least every three months, or more frequently if significant or worsening deficits are identified.

Cognitive side-effects might be reduced by:

- extending the interval between maintenance treatments to as long as possible
- using right unilateral electrode placement
- using the technique of ultrabrief pulse
- regular review and adjustment of psychotropic medications.

9.6 Duration of maintenance ECT

Little guidance is available on when maintenance ECT should be ceased. A Task Force of the American Psychiatric Association has stated that 'maintenance ECT…should not be interminably prolonged. Such a practice is unwarranted and if performed with bitemporal placements may produce severe, continuous, cognitive deficits...[A] second opinion should be sought before continuing maintenance ECT for more than 1 year or 12 treatments, whichever comes first.' High-risk patients may benefit from treatment over years, but the duration can only be determined empirically (Rabheru and Persad, 1997). Australian authorities have noted that it is usual to continue 'until patients have had at least one year of good health' (Tiller and Lyndon, 2003).

The need for maintenance ECT should be regularly reviewed and documented. Plans to stop treatment should be developed in consultation with the patient and their family.

9.7 Documentation and legal requirements

Voluntary patients

In addition to the usual requirements for consent to treatment and maintenance of an adequate medical record, an entry should be made in the patient's file at least every six months describing:

- the continuing need for ECT and the response
- discussions with the patient and, if appropriate, the family on the risk-benefit of maintenance treatment and the option of ceasing treatment.

Involuntary patients

Additional documentation is required for involuntary patients having maintenance ECT. In general, approval for treatment through the MHRT extends for only 12 treatments and the determination has effect for only six months. However, the MHRT can, under special circumstances, specify more than 12 treatments if satisfied that a higher number is justified.

Table 1: Examples of continuation ECT schedules

Method	ECT schedule	Total number of C-ECT administered in 6 months
Abrams or fast transition	1st: 1 week after index course of ECT 2nd: 2 weeks later 3rd: 3 weeks later 4th and subsequent: monthly (×4)	7
CORE or slow transition	Weekly (×4) Two-weekly (×4) Monthly thereafter (×3)	11
Moderate transition (Fox, 2001)	Weekly (× 3-4) Two-weekly (×2) Monthly (×4)	9-10
STABLE (Lisanby, 2008)	Flexible (under investigation)	

9.7 References

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SECTION 10

Credentialling and clinical privileging of medical staff

10.1 Definitions

Credentialing refers to the formal process used to verify the qualifications, experience, professional standing and other relevant professional attributes of medical practitioners. The purpose is to form a view about their competence, performance and professional suitability to provide safe, high quality health care services within specific organisational environments (for example, the process of assessing a person's skills in performing ECT).

A process for defining the scope of clinical practice (*clinical privileging*) follows *credentialing*. It involves delineating the extent of a medical practitioner's clinical practice within a particular organisation based on the individual's credentials, competence, performance and professional suitability, and the needs and the capability of the organisation to support this type of clinical practice. For example, a psychiatrist credentialed to perform ECT can seek clinical privileges to perform ECT in a hospital that delivers ECT at which he or she has a substantive appointment, and at which there is a requirement for additional psychiatrists to be clinically privileged to deliver ECT.

ECT is a sophisticated medical procedure that requires specialist knowledge and skills. A specialist qualification in psychiatry by itself, should not be sufficient to satisfy organisational credentialing requirements for the administering of ECT. It is imperative that the practice of ECT is based on adequate knowledge and skills that are updated regularly, to ensure that it is delivered safely and effectively.

Each organisation must determine whether it can support the delivery of ECT before it can consider conferring clinical privileges on to a credentialed medical practitioner. Factors to be considered include sustainable resources (such as budget and workforce), a suitable location for the delivery of safe and effective ECT, and an ongoing commitment by management to the practice of high quality ECT as evidenced by the provision of adequate training and quality improvement processes.

10.2 Responsibility for clinical privileging

Medical practitioners wishing to be considered for clinical privileging must make application to the Area Credentialing Committee, who will in turn make a recommendation to the Area Medical and Dental Appointments Advisory Committee.

The Chair of the ECT Committee within each site (or network of sites) will be responsible for assessing senior medical staff (staff specialists, clinical academics and VMOs) regarding their suitability for receiving clinical privileges in ECT. The Chair will then recommend to the Clinical Director at that site those individuals to be credentialed and those who will supervise the delivery of ECT.

10.3 Initial clinical privileging process

Consultant psychiatrists can apply to receive clinical privileges for ECT at several points during their appointment at a hospital:

- At the commencement of employment as a staff specialist/ clinical academic or a VMO contract period.
- At a regular, routine performance appraisal.
- As the need arises within a local service, for example, on the resignation of another ECT-privileged psychiatrist.

There will be two components to the initial clinical privileging process:

1. *Evaluation of the individual's professional involvement in ECT, including:*

    - past education and training in ECT, including any continuing medical education activities
    - experience in delivering ECT
    - history of privileging in ECT at other centres (including private hospitals)
    - any other relevant activities (for example, teaching and supervising in ECT, development of local ECT protocols, reviewing or writing journal articles on ECT).

2. Assessment of technique:

The evaluator (ECT Chair or nominee) will observe the psychiatrist giving sufficient ECT treatments to ascertain that his/ her technique is adequate on the following:

- EEG monitoring and the cuff limb technique
- all types of ECT (variations in electrode placement etc) relevant to the service
- titration of seizure threshold and stimulus dosing
- manipulation of all the ECT machine settings
- awareness of the anaesthetic aspects of the treatment.

An example of the evaluation form is provided at Appendix 3.

The psychiatrist should be considered eligible for full clinical privileges if both points are satisfactorily achieved.

For those psychiatrists who will lead the ECT service (usually as Chair of the ECT committee), it is recommended that they will have attended an appropriate ECT training course (see Appendix 4) or obtained an equivalent professional education on ECT within the last five years.

10.4 Ongoing clinical privileging

The Chair of the ECT Committee should ensure that each doctor who has been granted ECT privileges should maintain a minimum standard of practice. It is recommended that this is evaluated by:

1. Completion of at least 20 ECT treatments each year, including at least 10 treatments performed personally. The remainder can involve treatments given jointly by the psychiatrist and a registrar/ CMO.

2. A yearly review by the ECT Chair, in which the practitioner's technique is checked (as above).

10.5 Privileging of psychiatry registrars and CMOs

RANZCP guidelines provide some specific requirements in relation to ECT training, to be completed by all psychiatry trainees during basic psychiatry training. However, completion of this training requirement should not be considered adequate to enable a trainee to deliver ECT without the direct observation of a supervising consultant.

The Chair of the ECT Committee needs to be satisfied that a trainee has acquired the skills and knowledge to be able to deliver ECT, unobserved, under the remote supervision of a consultant psychiatrist with clinical privileges in ECT. The same standard should be applied to non-FRANZCP trainees participating in ECT, for example career medical officers.

SECTION 11

Nursing and coordination requirements for ECT

There are five components of nursing care in ECT. Points 1, 2 and 5 are provided by ward nursing staff. Points 11.3 and 11.4 should be conducted by a nurse who has had specific training in ECT.

11.1 Provide emotional and educational support to the patient and family/ carer:

1.1.1 Provide orientation to the ECT suite or theatre complex.

1.1.2 Reassure the patient and their family/ carers that ECT is a safe and effective treatment that produces a rapid clinical response.

1.1.3 Review of information obtained by the patient from the treating doctors to answer any questions that may arise.

1.1.4 Refute any false beliefs that the patient and carer may have about the procedure.

11.2. Assess the pre-treatment plan and the patient's physical state, memory and functional ability prior to ECT:

1.2.1 Check that there has not been any recent change in health status.

1.2.2 Conduct pre-treatment measurement of temperature, blood pressure, pulse, respiration rate and oxygen saturation. Measure the blood glucose levels in patients with diabetes.

1.2.3 Record fasting, voiding and dentition status.

1.2.4 Ensure that the patient is dressed appropriately.

1.2.5 Ensure that the patient has appropriate identification leg or wrist bands fastened.

1.2.6 Check that all legal documents have been signed and are valid.

1.21.7 Check that the appropriate consent papers have been signed.

1.1.8 Ensure that appropriate measures have been completed to assess memory and efficacy of treatment.

1.2.9 Assess the patient's physical status concerning safety, mobility, orientation.

1.2.10 Assess the patient's mental state, highlighting any psychotic or suicidal ideation that may compromise safety.

11.3 Prepare and monitor the patient during the procedure:

11.3.1 Greet the patient in the waiting area and introduce them to the treating team.

11.3.2 Provide comfort and reassure at all times before, during and after the procedure.

11.3.3 Assist the treating ECT medical officer with the preparation and delivery of the treatment and other clinical tasks required.

1.3.4 Provide support to the anaesthetist and anaesthetic assistant as required.

1.3.5 Ensure that appropriate 'time out' measures have been conducted and recorded.

1.3.6 Ensure that all information has been recorded in the ECT register, clinical information sheet or computer record.

1.3.7 Assist the anaesthetic team in the care of an unconscious patient and subsequent transfer to the recovery area.

11.4 Patient recovery

11.4.1 Follow the recovery observation guidelines as specified by the local area health service.

1.4.2 Take responsibility for ensuring that the patient has re-orientated to time, place and person and is fit to return to the ward or be discharged home according to local area health policy.

1.4.3 Take due care in ensuring that patient privacy, respect and dignity is maintained at all times.

11.5 Role of ward nurse

1.5.1 Ensure the patient's comfort on return to ward by assisting the patient to eat or rest.

1.5.2 Assess the gag reflex before patient eats, usually by asking them to have a small sip of fluid.

1.5.3 Review the patient for side-effects of the treatment, recording data in the medical record and advising the ward doctor for assessment and possible treatment as required.

1.5.4 Complete vital observations and orientation for the first hour, usually every 15 to 20 minutes or as specified by the local area health service.

1.5.5 Ensure that the appropriate medical officers review the patient within 24 hours or earlier if necessary.

1.5.6 Reflect these elements of nursing care in the nursing care plan for patients receiving ECT.

11.6 Role of the ECT Coordinator

An ECT Coordinator must be identified within each ECT service, with dedicated hours allocated as appropriate to the workload of the unit. The role of the ECT Coordinator, who may be a nurse or other healthcare professional, is to oversee the running of the ECT service in consultation with the psychiatrist in charge.

Principal functions include the following:

- advocate on behalf of patients having received ECT, their family and friends
- inform patients and their family/ carers about all aspects of ECT in conjunction with the treating team
- provide information and education to hospital staff, community-based staff and students
- educate staff about the importance of informed consent
- participate, as appropriate, in ECT training for nursing and medical staff
- encourage administrative and quality improvement activities that promote the efficient running of the ECT service
- maintain accurate statistical information and reports for service evaluation and research
- promote compliance with the MHA and other relevant legislation
- encourage professional standards
- coordinate nursing practices throughout the delivery of ECT
- promote quality improvement in all facets of nursing care and evaluate nursing standards
- liaise with anaesthetic, theatre, recovery and porter staff to support quality care
- ensure routine checking of the ECT device (including servicing at least annually), required equipment, medication and other supplies.

Some activities and responsibilities of the ECT Coordinator are listed in Table 2 below.

Table 2. Activities and responsibilities of an ECT Coordinator

Before ECT

- Attend ward rounds to review existing and new ECT patients.
- Prepare new patients for anaesthetic consultations.
- Arrange for interpreters for non-English speaking patients and carers.
- Coordinate ECT lists, accounting for clinical need.
- Ensure outpatient areas are supervised, clean and tidy, and comply with requirements for infection control and occupational health and safety.
- Ensure patients receive adequate food and drink after treatment.
- Ensure all porter, medical, nursing, and administrative staff are present.
- Ensure good communication with all staff about patients' clinical needs.
- Ensure that specific patient consent has been obtained before students and non-clinical staff attend treatments.
- Welcome all patients presenting for treatment, and confirm that clinical and legal documentation has been finalised.
- Facilitate the preparation of the paperwork required for ECT.

After ECT

- Ensure safe transfer of the patient to the staff member responsible for recovery.
- Ensure ECT documentation is completed.
- Ensure cleaning, sterilising (as required) and re-stocking of the treatment area after a list is completed.
- Ensure all team members are supported, especially recovery and porter staff who will remain on duty after the ECT team has departed.
- Ensure that inpatients return safely to the ward and outpatients, on leaving the unit, have been accompanied by a responsible adult who can provide continuing supervision for up to 24 hours.
- Arrange for follow-up phone contact with outpatients the next day.
- Check that medical staff review the patient regularly during the course of ECT.

Acknowledgments: Stephen Finch RMN RGN; North West ECT Nurse Group; The Glasgow ECT Nurses Forum.

SECTION 12

Clinical governance

12.1 Clinical governance mechanisms

There are three tiers of clinical governance that oversee the practice of ECT within NSW public sector Mental Health Services:

- NSW Health
- Area Health Services
- Individual site/ facility

At each of these levels, there are specific governance responsibilities in relation to the practice of ECT.

NSW Health

These ECT Standards are applicable throughout New South Wales.

NSW Health will retain oversight of ECT practice standards through the Clinical Governance Unit of the Mental Health Drug and Alcohol Office (MHDAO). Additionally, any issues that arise in relation to the practice of ECT within NSW will be considered by the NSW Mental Health Clinical Advisory Council (CAC).

Area Health Service

Each Area Health Service with ECT facilities should establish an Area Standing Committee that meets regularly and addresses the following issues:

- monitoring adherence of each ECT program within the Area to the NSW ECT practice standards.
- ensuring the maintenance of minimum acceptable standards of clinical practice and governance across all ECT programs within the area.
- reviewing and evaluating collated ECT clinical indicator/ audit data.

It is envisaged that this Committee would be comprised of a relatively small number of senior clinicians and managers from within the mental health program, and would meet regularly but infrequently (2-3 times per year). The Area ECT Committee should report to a relevant committee within the Area Mental Health Program that has overarching responsibility for clinical standards (for example, the Area Mental Health Executive or the Area Mental Health Quality/ Clinical Governance Committee).

Site/facility

Each site that performs ECT should establish a local ECT Committee, to deal predominantly with local operational issues. It should meet more frequently than the Area Committee (4-6 times per year) and include key clinicians and managers involved in the delivery of ECT, across disciplines and service settings (for example, medical and nursing staff from Mental Health, mental health operations managers, theatre nursing staff and anaesthetic specialists).

The work of this Committee should include:

- establishing and reviewing local operational protocols for ECT delivery.
- ensuring that all clinicians involved in the delivery of ECT are adequately trained and/ or credentialed, as required.
- ensuring compliance with statutory requirements under the MHA for the delivery of ECT.
- ensuring that all necessary clinical indicator data are collected for the purpose of audit and benchmarking.
- trouble-shooting any current or anticipated difficulties in local ECT delivery in a timely and responsive manner.

The Committee's role should specifically exclude the development or amendment of policy or clinical practice guidelines, as this is an issue for either the Area ECT Committee or NSW Health.

According to individual Area Health Service requirements, it may be desirable to incorporate two or more smaller ECT sites into a single Network/ Sector ECT Committee. This is particularly relevant to Area Health Services that include regional or rural services. The function of such a committee should be equivalent to 'single site' ECT Committees.

Private hospitals

The governance arrangement for private hospitals that perform ECT may differ from that in Area Health Service facilities.

Adherence to the NSW Health ECT Standards will not be mandatory for private hospitals, but their application in private health care settings is encouraged. The ongoing involvement of private hospitals, and their senior clinicians, in the review of clinical practice standards, data collection and evaluation is highly desirable.

The governance model for private hospitals suggests either a 'one tier' or 'two tier' model. For larger private hospital conglomerates that have a single Director of ECT across the network, the 'two tier' model may be the most appropriate. The role of the Director would include overarching responsibility for ensuring that standards of ECT practice are maintained, including adequate training and credentialing, documentation, data collection and auditing.

At a minimum, each individual private hospital that provides ECT should have an ECT Committee comprising psychiatrists, relevant nursing staff, operations managers, and representatives from anaesthetics.

12.2 Monitoring and auditing the ECT service

Each Area should establish a system for monitoring and auditing the ECT services at individual hospitals. *Monitoring* can be defined as a system of continuous data collection designed to detect breaches of protocol, critical incidents or failure of procedures as they occur. *Auditing* refers to a system of evaluating, at intervals in time, the extent or otherwise to which an ECT service adheres to or deviates from established guidelines and protocols, as well as evaluating the efficacy of a service through collecting outcome data.

There are two levels to *monitoring* an ECT service: the systemic level and the individual patient.

1. Systems issues:

    1.1 Cancelled treatments due to, for example:

    - unavailability of the ECT facility
    - inadequate documentation (for example, missing consent)
    - breaches of fasting requirements
    - rostering problems (for example, non-attendance or staff absences)
    - equipment problems (for example, oxygen supply failure, ECT machine not in working order, no back-up apparatus).

    1.2 Inadequate documentation and records management, including a failure to acquire adequate EEG recordings and store them chronologically in an accessible manner.

    1.3 Patient withdrawal due to, for example:

    - failure of follow-up after previous treatment (for example, outpatient ECT)
    - failure of communication, for example, consultant unavailable
    - patient absent (inadequate surveillance).

2. Individual patient treatment issues:

    2.1 Failed treatment, for example:

    - failed venous access preventing anaesthesia
    - no seizure identified.

    2.2 Minor morbidity incurred during the delivery of ECT, for example:

    - minor dental (for example, chipped tooth, damaged prosthesis)
    - superficial burns at site of stimulus electrodes
    - adhesive sensitivity
    - haematoma > 2.5cm post-venepuncture
    - prolonged seizure requiring intervention
    - delayed recovery (> 1 hour) post-anaesthesia.

    2.3 Major morbidity incurred during the delivery of ECT, for example:

    - arterial puncture
    - serious dental damage (broken or missing tooth)
    - post-seizure agitation requiring intervention
    - airway difficulties requiring intervention
    - musculoskeletal injury
    - aspiration
    - transfer to other facility for any reason
    - prolonged post-treatment confusion (>24 hours)
    - cardiac arrest.

Any of the above should be documented in the clinical file or otherwise recorded and data collected to be forwarded to the local ECT Committee. Any issue considered to require urgent attention and/ or intervention should be reported immediately to the Chair of the ECT Committee, or the service's clinical director.

NSW Health will develop Key Performance Indicators (KPIs) that will establish the benchmarks with which all ECT treatment performed in NSW will align. For example, no more than three missed or cancelled treatments per 100 occasions of service.

The primary purpose of an *audit*, as opposed to monitoring, is to ensure that ECT is being provided to patients in a manner that is of the highest standard and consistent with modern evidence-based practice. An effective audit will identify, using a checklist system, what is and what is not being done well so that services can be improved as necessary.

Ideally an audit would consist of an internal (within hospital) component as well as an external component, using auditors from another hospital or Area. The internal audit would be done on a regular (for example, annual) basis and would examine, through a sample chart review, such issues as diagnoses, reasons for ECT, adequacy of documentation, adherence to protocols, and outcomes including cognitive side-effects. The external audit would be more concerned with systems issues, including adequacy of the ECT suite and equipment, training and supervision of staff and the competency of staff in the ECT session through direct observation.

Useful models of ECT auditing are the ECTAS (www.rcpsych.ac.uk/cru/ECTA**S**.htm) and SEAN (www.sean.org.uk/) systems employed in the United Kingdom.

An important aspect of an audit is that it should provide documentary evidence of what a service is doing and how it is functioning, as well as providing evidence of the effectiveness and side-effect burden of ECT at each hospital. The results of the audit can form a basis for benchmarking between hospitals and will therefore encourage standardisation of care throughout NSW. It will also enhance the professionalism and satisfaction of the treatment teams.

SECTION 13

Appendices

Appendix 1: Consumer information on ECT (example)

Appendix 2: Information for patients going home on the same day of ECT treatment (example)

Appendix 3: ECT credentialing – practical technique

Appendix 4: Requirements for training courses

Appendix 5: Titration & Treatment Schedules

APPENDIX 1

Example of information provided to patients, families and carers on ECT

This information sheet will try to answer some of the questions you may have about Electroconvulsive Therapy (ECT). Your psychiatrist will discuss with you why ECT has been recommended for you.

What is ECT and why is it given?

ECT is a modern psychiatric treatment that is effective for a range of mental illnesses, including major depression, mania, some forms of schizophrenia and a small number of other mental and neurological disorders.

It might be used when medications have not worked or other forms of treatment are ineffective. It might also be used for people who have serious side-effects from medications or whose medical condition means they can't take medications safely.

A general anaesthetic and muscle relaxant is given. When these have taken full effect, i.e. when you are asleep, a brief, carefully controlled electrical current is passed through the brain, causing a seizure. You will wake up after 5 to 10 minutes, much as you would from minor surgery.

ECT usually consists of 6 to 12 treatments given 2 to 3 times a week over about a month. The total number of treatments needed to get a person better varies between individuals and your psychiatrist will discuss with you how many treatments you are likely to need. While most people show some improvement after 3 to 4 sessions, it takes on average 9 treatments to achieve recovery and some patients may need more than 12 treatments.

There is evidence that ECT is effective in improving depressive and psychotic symptoms. Approximately 8 out of 10 patients who undergo ECT will experience dramatic improvement.

How Does ECT Work?

A lot of research has been done into the changes that occur within the brain after ECT treatment. It is known that after ECT the activity levels of different parts of the brain are changed, hormones are released, and signalling between brain cells is modified. The latest research studies suggest that ECT may even result in the growth of new brain cells, possibly a process to 'repair' impaired brain circuits that may be responsible for depression. There is one accepted theory about how ECT works, leading some to claim that ECT is unscientific, or to reject it as a treatment.

When will your doctor order ECT treatment?

The decision to administer ECT is based on a thorough physical and psychiatric evaluation of the person, taking into account the type of illness, the degree of suffering, the expected result and the outlook for the person if the treatment is not given. When the risk of suicide is high or when a seriously ill person is unable to eat or drink, ECT can be life-saving.

Prior to your treatment

Before your first ECT treatment, you will be examined to make sure you are fit to have a short general anaesthetic and ECT.

You must not eat or drink anything including water for at least 6 hours before the ECT treatment to make sure your stomach is empty. This is called 'fasting'. If you eat or drink anything within the fasting period, you must tell the nursing or medical staff before the treatment. Some medication might be given early on the morning of ECT treatment, but only with a tiny sip of water.

How is ECT given?

In the operating theatre of the hospital the staff will attach the following to you:

- Blood pressure cuff on your arm or leg or both
- A small clip over one of your fingers to check heart rate and oxygen levels in your blood
- Small stick-on recorders on your forehead and behind your ears to record the brain's electrical activity during the treatment
- Face mask over your nose and mouth to give you oxygen. This is to prepare your body and brain for the extra activity that will happen briefly with the treatment.

You will have a short general anaesthetic so that you will be asleep and not feel or remember the treatment. The anaesthetic medication will be injected into a vein to make it work quickly and well. An anaesthetist will be present and give the anaesthetic. You will also be given a medicine to relax your muscles. You won't feel the seizure because of the anaesthetic, and any muscle movement during ECT will be limited because of the medicine given to relax your muscles.

A doctor who has specialised training in ECT will administer the treatment. The doctor puts small electrodes on your scalp and passes a measured amount of electricity to a part of the brain to cause a seizure. The seizure will last up to two minutes.

During the treatment, the anaesthetist will continue to give you oxygen through the face mask and monitor your heart rate and oxygen level. The anaesthetist will give you any medications necessary to adjust your heart rate etc during and after the treatment.

You will not feel or remember any of the actual treatment because you will be asleep due to the anaesthetic medication. Within a few minutes after the treatment, the anaesthetic will have worn off and you will wake up. During this time, you will be moved to the recovery room where you will be looked after until you are awake enough to return to your ward. If you are having day procedure ECT, you might need to wait in the recovery room or a ward for up to several hours to make sure you are ready to go home. After you wake up, the anaesthetic medication and the treatment will make you 'groggy' for a while.

Is it safe? What are the benefits of ECT? What about side-effects?

ECT is regarded as a very safe treatment. Research has shown that ECT doesn't cause brain damage or changes in personality because the amount of electricity used is too small to harm tissue.

Your psychiatrist will discuss with you the expected benefits of ECT. These will vary depending on the nature and seriousness of your illness, but ECT will generally improve your ability to think and return your emotions to a healthier state.

All treatments have risks and side-effects – even no treatment has risks.

The risks and side-effects of ECT include:

- Side-effects from the anaesthetic, such as headache, nausea or queasiness, vomiting. You should tell the staff looking after you and they will be able to give you some medication to help.
- You might get muscle soreness after the ECT as a result of the medicine given to relax your muscles.
- The anaesthetic will affect your judgment for the first 24 hours. During this time you must not:
  - Drive any type of vehicle
  - Operate machinery, including cooking implements
  - Make important decisions or sign a legal document
  - Drink alcohol, take other mind-altering substances or smoke because they might react with the anaesthetic medication.
- *A common and significant side-effect is confusion and memory impairment*.
  - Many people report difficulty with memory which usually clears up shortly after the end of treatment. For some it may last for a while longer (e.g. weeks to months) but improves with time.
  - Immediately after ECT most people have a short period of confusion and do not remember the actual treatment.

- Over the course of ECT, it might be more difficult to remember newly learned information, eg events that occurred during the weeks you were having ECT.

- Some people also report a patchy loss of memory of events that occurred during the days, weeks and months before the ECT. Memory for recent events, dates, names of friends etc. may not be as good. In most patients the memory problems go away over the days, weeks or months following completion of the course of ECT. Sometimes, but not often, there may be permanent loss of some memories from your past.

- Many people find that their memories are somewhat unclear for the time that they were ill. The same problem is often experienced by people with depression who do not receive ECT.

- Although specific memories from around the time you had ECT might not return, your overall memory should work better in the weeks to months after treatment. Many patients report that their memory improved after a course of ECT.

- Some other side-effects are less common and some are extremely rare:
  - There is a less common risk of medical complications, such as irregular heart rate and rhythm. There might be a temporary rise in blood pressure and heart rate followed by a slowing of the heart rate.

  - As with any general anaesthetic, there is a very small risk of death, but with modern ECT and a short anaesthetic, this risk is now extremely rare. No case of death associated with anaesthesia for ECT has been recorded in New South Wales for more than 25 years.

  - Heart attack, stroke or injury related to muscle spasms are also extremely rare.

  - Resuscitation equipment and emergency procedures are immediately available if anything should go wrong.

- What are the alternatives to ECT? Talk to your psychiatrist about other treatments may be available.

Giving permission for ECT

Just as with any other medical procedure, informed consent for ECT must be obtained in writing. Informed consent is when you agree to have ECT after you have been told what ECT involves, including:

- a full explanation of the ECT procedure
- how it works
- how it can help your illness
- possible side-effects, discomforts and risks of ECT
- any beneficial alternative treatments.

You have the right to discuss your views about ECT with your psychiatrist and ask any questions about it.

You also have the right to:

- obtain medical and legal advice
- obtain a second opinion from a psychiatrist about the ECT. Your psychiatrist can arrange a second opinion from within the mental health service.
- have a friend, family member, lawyer or an advocate represent you before you consent to ECT.

If you agree to have ECT, you will be asked to sign a form to say you have given informed consent. This means if you are able to give informed consent, you have the right to refuse ECT.

If you are not able to give informed consent, or if your health professionals consider that ECT treatment is potentially life saving, then your psychiatrist will seek consent on your behalf through the Mental Health Review Tribunal, even if you don't want the treatment.

The Mental Health Review Tribunal becomes involved in decisions about ECT when the hospital:

- is uncertain of a voluntary patient's capacity to give consent to treatment with ECT; and
- proposes ECT for an involuntary patient.

Your psychiatrist must do everything reasonably practicable to give notice to your nearest relative, guardian or personal friends about the application for ECT. The Mental Health Review Tribunal will make the decision about whether or not you are to be treated with ECT.

If you agree to have ECT, but then change your mind, it is your right to withdraw your consent *at any time* and the treatments will be stopped, unless your psychiatrist believes you are unable to give informed consent. If you want to withdraw your consent, you should talk to your psychiatrist. Remember that you can have a friend, a family member, a lawyer or an advocate with you for support or to represent you.

Will I need further treatment?

While your illness might be treated with a course of ECT, the illness might come back once the course is finished. Some people need occasional continued ECT treatment, spread-out from around once a week to once a month. To help prevent relapse, your doctor will discuss with you any further treatment you might need after the course of ECT ends, such as medication, maintenance ECT, psychotherapy, counselling and/ or rehabilitation.

References

SANE ECT Information Sheet:
http://www.sane.org/information/factsheets

Better Health Channel ECT Information Sheet:
http://www.betterhealth.vic.gov.au

Victorian Government Health Information:
http://www.health.vic.gov.au

APPENDIX 2

Information for patients going home on the same day of ECT treatment

The following information may assist you in your recovery from your ECT treatment today.

Before leaving the mental health unit

After your treatment you will be returned to the ward where **you must stay for 4 hours to ensure you are well enough to go home following the anaesthetic.**

The nursing staff will ensure you see a doctor before leaving the ward.

You will be given an appointment card with the date of your next treatment.

What to expect after ECT treatment

The anaesthetic will affect your judgment and you may feel a little lightheaded, slower to react or sleepy for the next 24 hours. During the 24 hours after ECT treatment you MUST NOT:

- Drive any type of vehicle (therefore, someone will need to pick you up from hospital)
- Operate machinery, including cooking implements
- Make important decisions or sign a legal document
- Drink alcohol, take other mind-altering substances or smoke because they might react with the anaesthetic medication
- Engage in heavy work or strenuous activities.

Managing side-effects from ECT treatment and the anaesthetic

- Side-effects from the ECT treatment may include headache. You may take medication such as paracetamol for a headache as directed by your doctor.
- Side-effects from the anaesthetic may include nausea, queasiness or vomiting. A light diet is recommended after an anaesthetic. If you are experiencing nausea or vomiting, do not eat solid food and drink clear fluids only. Should nausea and vomiting continue tomorrow, contact your local doctor.

APPENDIX 3

ECT Credentialing – Practical Technique

Date: . . . . . .

ECT Psychiatrist: . . . . . .

Accreditor: . . . . . .

Signature: . . . . . .

Knowledge of ECT Dosing Protocol

Capability	Adequate ✓	Comments
Titration		
Dose relative to seizure threshold		
Criteria for increasing dose		

Interpretation of ictal EEGs

Capability	Adequate ✓	Comments
Identify seizure activity		
Quality of EEG seizure		

EEG Monitoring

Capability	Adequate ✓	Comments
Skin preparation		
Electrode placement		
Quality of recording/managing artefact		
Setting parameters – gain etc		

Treatment Electrodes

Capability	Adequate ✓	Comments
Alternative techniques (hand held, thymapads, rubber bands)		
Impedance		
Skin – electrode contact		
Identification of treatment sites		
Setting of treatment parameters		

APPENDIX 4

Requirements for Training Courses

An appropriate training course should contain an equivalent of at least one day of training including theory and practical experience, as follows:

1. **Theoretical component including:** mental health legislation and ECT; electrophysiology in ECT; mechanisms and indications for ECT; pre-treatment assessment for ECT; obtaining patient consent for ECT; patient rights and providing patient and carer information; the use of concomitant medication with ECT; treatment techniques including electrical stimulus, electrode placements, induced seizures, monitoring options, dosing protocols; course of ECT – acute, continuation and maintenance; pre-medications, anaesthetics and muscle relaxants with ECT; assessment and care of ECT outpatients and day patients; ECT and risk management in 'high risk' patients such as pregnant, elderly, adolescent or medically compromised patients; post-ECT evaluations; evidence base for ECT including key research papers;
2. **Practical component including:** ECT titration; cuffed limb technique, administration of bilateral and unilateral ECT treatments; demonstrate familiarity with an approved ECT machine; recording and interpretation of ictal EEG strips.

APPENDIX 5

Titration & Treatment Schedule

Titration and Treatment Schedule for RUL Ultra Brief Pulse

(0.3mSec pulse width)

Thymatron System IV

Titration		**RUL Treatment 6X Threshold**	
LEVEL	**STIMULUS SETTINGS**	**LEVEL**	**STIMULUS SETTINGS**
U1 (Start RUL titration)	2% →	RU 9	12% (or 10%)
U2	4% →	RU 10	25%
U3	8% →	RU 11	50%
U4	15% →	RU 12	90%
U5	25% →	RU 13	150%
U6	35% →	RU 14*	200%
U7	50% →		
U8	75% →		

* For RUL ECT RU14 is the maximum dose available:

Threshold U6 → treat RU 14 = treatment @ 6 times threshold

Threshold U7 → treat RU 14 = treatment @ 4 times threshold

Threshold U8 → treat RU 14 = treatment @ 3 times threshold

Titration and Treatment Schedule for RUL Ultra Brief Pulse

(0.3mSec pulse width)

MECTA Spectrum 5000 Q

Titration		**RUL Treatment @ 6X Threshold**	
LEVEL	**STIMULUS SETTINGS**	**LEVEL**	**STIMULUS SETTINGS**
U1 (Start RUL titration)	0.3ms/20Hz /1.0s/800mA 9.6 mC →	RU 9	0.3ms/40Hz/3.0s/800mA 57.6 mC
U2	0.3ms/20Hz/2.0s/800mA 19.2 mC →	RU 10	0.3ms/50Hz/5.0s/800mA 120 mC
U3	0.3ms/20Hz/4.0s/800mA 38.4 mC →	RU 11	0.3ms/60Hz/8.0s/800mA 230.4 mC
U4	0.3ms/20Hz/8.0s/800mA 76.8 mC →	RU 12	0.3ms/120Hz/8.0s/800mA 460.8 mC
U5	0.3ms/50Hz/5.0s/800mA 120 mC →	RU 13	0.5ms/110Hz/8.0s/800mA 704 mC
U6	0.3ms/50Hz/7.5s/800mA 180 mC →	RU 14*	0.7ms/120Hz/8.0s/800mA 1075.2 mC
U7	0.3ms/70Hz/ 8.0s/ 800mA 268.8 mC →		
U8	0.3ms/100Hz/8.0s/800mA 384 mC →		

*For RUL ECT RU 14 is the maximum dose available:

Threshold U6 → treat RU 14 = treatment @ 6 times threshold

Threshold U7 → treat RU 14 = treatment @ 4 times threshold

Threshold U8 → treat RU 14 = treatment @ 3 times threshold

Mecta						DOSE	Thymatron	
Sex and Place	**mC**	**Pulse Width**	**Frequency**	**Duration**	**Current**	**Level**	**% energy**	**mC**
F UL	32	1	40	0.5	0.8	**1**	5	25
F-BL M-UL	48	1	40	0.75	0.8	**2**	10	50
M BL	80	1	40	1.25	0.8	**3**	15	76
	128	1	40	2	0.8	**4**	25	126
	192	1	60	2	0.8	**5**	35	176
	288	1	60	3	0.8	**6**	50	252
	432	1	60	4.5	0.8	**7**	70	353
	576	1	60	6	0.8	**8**	100	504
	864	1	90	6	0.8	**9**	140	705
	1152	1	120	6	0.8	**10**	200	1008

Threshold Determination

- Start at level 1 for Female UL, Level 2 for Female BL and Male UL, level 3 for Male BL as indicated in left most table column.
- Increase by one level if restimulation is necessary.
- If there is no adequate seizure after 3 stimulations increase TWO levels for the fourth stimulus and if successful drop one level for the first stimulus at the next treatment session to continue titration, before proceeding to treatment dose
- If no seizure after four stimuli, abort session and increase by one level for first stimulus at next session to continue titration.

Successive Treatments

After establishing lowest level needed to produce an adequate seizure increase by

For	High dose UL	(approx 5 x ST)	– increase 4 levels
	Low dose BL	(approx 1.5 x ST)	– increase 1 level
	High dose BL	(approx 2 – 2.5 x ST)	– increase 2 levels

Whenever further increases in stimuli are indicated increase by ONE for UL and ONE for BL.

(ST= seizure threshold)

Criteria for restimulation

Poor EEG seizure morphology (*).

(*) Consider the following: morphological regularity, interhemispheric coherence, post ictal suppression, EEG amplitude, distinct slow wave, recognisable polyspike +/- spike and wave pattern.

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