

Electroconvulsive therapy

Introduction

In electroconvulsive therapy (ECT), an electric shock is delivered to the brain by way of electrodes placed on the patient's temples. Electrodes may be placed bilaterally or unilaterally. ECT is an effective way to treat patients with affective disorders and selected schizophrenias or related psychoses.

A doctor is primarily responsible for administering ECT, but safe and effective therapy requires an interdisciplinary approach and cooperation. The nurse's role is to provide care during the assessment, preparation, treatment, and recovery of the patient. The treatment team also includes a certified registered nurse-anesthetist (CRNA) or anesthesiologist and, possibly, a nurse or nurse practitioner (NP).

The doctor's role is to obtain appropriate consent, order pretreatment and posttreatment regimens, titrate drug doses, administer treatment, and determine when the patient may be released from the post-ECT recovery unit. The CRNA is responsible for ensuring a patent airway, administering positive-pressure oxygen during the treatment and until the patient is breathing well on his own, and administering specific drugs during the procedure. If a nurse or an NP is part of the team, she's responsible for making sure all equipment, drugs, and emergency equipment are available; preparing the patient by attaching electrocardiograph (ECG) and EEG monitors; explaining the procedure to the patient; and completing a preprocedure assessment.

Equipment

- Appropriate EEG/ECG machine and connection wires
- Rubber headband
- Two stimulus electrodes
- Conduction gel
- ECG electrodes
- Crash cart with emergency drug kit and defibrillator
- Suction machine with sterile pharyngeal catheters
- Endotracheal (ET) intubation tray
- Rubber mouthpiece
- Electronic blood pressure monitor
- Pulse oximeter and sensor
- Oxygen source and tubing with positive-pressure equipment
- Two pairs of gloves
- Alcohol pads
- 21G needles

- Butterfly infusion set
- Sterile 3-ml, 5-ml, and 10-ml syringes
- Methohexital
- Succinylcholine (Anectine)
- Glycopyrrolate (Robinul)
- Dantrolene (Dantrium)
- Tape
- Sterile water or normal saline solution for injection
- Tourniquet
- Patient's medical record
- Documentation records
- Stretcher
- Optional: protective equipment such as gloves, gowns, masks, and eye protectors

Preparation of Equipment

Plug in the EEG/ECG machine and make sure all recorders have paper and are working properly.

Set the treatment parameters as ordered for pulse width (ms), frequency (Hz), duration (sec), and current (amp). These parameters represent the "total volume" of electrical stimulus applied, which differs depending on the patient's age, medication, seizure threshold, and other factors. Plug in the electronic blood pressure monitor. Also make sure the crash cart with emergency drug kit and defibrillator, as well as suction equipment, an ET intubation tray, and oxygen, are readily available and that needed medications are properly prepared. (See *Medications for ECT.*)

| MEDICATIONS FOR ECT | | |
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| <i>Even though the doctor or certified registered nurse-anesthetist administers these medications during electroconvulsive therapy (ECT), you should become familiar with them so you can assess the patient for adverse effects. Brief descriptions of the most commonly used drugs appear below.</i> | | |
| Drug | Actions | Adverse reactions |
| 1. dantrolene (Dantrium) | Dantrolene is a direct-acting skeletal muscle relaxant that's effective against malignant hyperthermia. | Seizures, muscle weakness, drowsiness, fatigue, headache, hepatitis, nervousness, insomnia |
| 2. glycopyrrolate (Robinul) | Glycopyrrolate has desirable cholinergic blocking effects because it reduces secretions in the respiratory system as well as oral and gastric secretions. It also prevents a drop in heart rate caused by vagal nerve stimulation during anesthesia. | Dilated pupils, tachycardia, urine retention, anaphylaxis, confusion (in elderly), dry mouth |

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| 3. methohexital | Methohexital is a rapid, ultra-short-acting barbiturate anesthetic agent. | Hypotension, tachycardia, respiratory arrest, bronchospasm, anxiety, hypersensitivity reaction, emergence delirium |
| 4. succinylcholine chloride (Anectine) | Succinylcholine is an ultra-short-acting depolarizing skeletal muscle relaxant. Given I.V., it causes rapid, flaccid paralysis. | Bradycardia, arrhythmias, cardiac arrest, prolonged respiratory depression, malignant hyperthermia, anaphylaxis |

Implementation

1. Check the doctor's order.⁴
2. Gather the appropriate equipment.
3. After arrival in the ECT room, confirm the patient's identify using two patient identifiers according to your facility's policy and check his nothing-by-mouth status.²
4. Explain the procedure to the patient *to allay anxiety*. Provide teaching on what to expect before and after the procedure, including possible confusion, disorientation, and short-term memory loss.
5. Make sure the doctor has obtained written informed consent.⁴
6. Make sure the patient's history (including allergies to medications or latex), physical examination, and dental evaluation are documented in his chart.
7. Make sure the following diagnostic tests have been completed and assessed: complete blood count, metabolic panel, thyroid profile, urinalysis, ECG, pseudocholinesterase activity determination (especially in patients with severe liver disease, malnutrition, or a history of sensitivity to muscle relaxants or similar substances), chest and spine X-rays, EEG, and cranial computed tomography scan.
8. Perform hand hygiene and put on gloves.³
9. Help the patient remove dentures, partial plates, or other foreign objects from his mouth *to prevent choking*.
10. Remove and dispose of gloves.
11. Make sure the patient removes all jewelry, metal objects, and prosthetic devices before the procedure *to prevent injury*.
12. Have the patient dress in a hospital gown and ask him to void *to prevent incontinence during the procedure*.
13. Help the patient onto the stretcher.
14. Put on gloves and insert an I.V. catheter. (See the "I.V. catheter insertion" procedure.)
15. Attach the patient to an electronic blood pressure monitor and check his baseline vital signs.
16. Attach the patient to a pulse oximeter to monitor his respiratory status during the procedure *because the drugs used cause respiratory depression*.

17. Attach the patient to the ECG monitor.
18. Attach the EEG electrodes and stimulus electrodes to the rubber headband. Coat the electrodes with conduction gel and place the band around the patient's head. Place the large, silver-colored stimulus electrodes on each temple at about eye-level. Space the small, brown-colored EEG electrodes across the forehead.
19. Connect the stimulus electrodes to the stimulus output receptacle on the machine.
20. Run the machine in the self-test mode. When the machine is ready, it displays the message "Self Test Passed" and prints the date, time, treatment parameters, a brief ECG strip, and EEG monitors.
21. The CRNA or doctor then administers glycopyrrolate, followed by methohexital. Methohexital acts very rapidly. Expect an abrupt loss of consciousness when the appropriate dose is infused.
22. After the patient is unconscious, succinylcholine is administered. A tremor or fasciculation of various muscle groups occurs due to the depolarizing effect of this drug. Succinylcholine also causes complete flaccid paralysis, so mechanical ventilation is started at this time. A rubber mouthpiece is inserted and positive-pressure oxygen is given.
23. The doctor initiates the stimulus, and mild seizure-like activity occurs for about 30 seconds. The patient's jaw and extremities must be supported while avoiding contact with metal.
24. Monitor vital signs as well as ECG and EEG rhythm strips. Assess the patient's skin for burns.
25. When spontaneous ventilation returns, usually in 3 to 5 minutes, discontinue the I.V. infusion. Continue to monitor vital signs.
26. As the patient becomes more alert, speak quietly and explain what is happening. Remove the rubber mouthpiece.
27. Place the patient on his side *to maintain a patent airway*. Measure and document vital signs every 15 minutes until they stabilize.
28. Discharge the patient from the recovery area when he's able to move all four extremities voluntarily, can breathe and cough adequately, is arousable when called and oriented, has an Aldrete score that is seven or greater, has stable vital signs and temperature within 1° of the pretreatment value, and has a normal swallowing reflex. A doctor's order is required to release the patient from the recovery area.
29. One hour after treatment, obtain and record the patient's vital signs. Check the patient's temperature to assess for malignant hyperthermia. Then continue to check vital signs every hour as necessary until the patient is stable.
30. Document the procedure. 

Special Considerations

1. If the patient is taking benzodiazepines before the procedure, obtain an order to begin tapering and discontinue the drugs 3 to 4 days before the procedure. Benzodiazepines

and anticonvulsant drugs (such as lorazepam and phenytoin) would negatively affect the patient's response to treatment.

2. Contraindications to ECT include brain tumors, space-occupying lesions, and other brain diseases that cause increased intracranial pressure. The seriousness of any physical illness, such as heart, liver, or kidney disease, and the psychiatric disorder always have to be weighed against each other before ECT is initiated.
3. Malignant hyperthermia is an uncommon but potentially life-threatening complication that can follow the administration of an anesthetic agent or a depolarizing muscle relaxant such as succinylcholine. Immediately report an oral temperature above 100° F (37.8° C) within 1 hour after treatment. Follow your facility's policy and procedure for a malignant hyperthermia crisis.

Documentation

Document using flow sheets or progress notes. Include the patient's vital signs and responses during the treatment sequence, recovery, and post-recovery. Assess and document the patient's physical and mental status and any behavioral changes or lack of such changes.

References

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1. Check the order.
2. Gather and prepare the appropriate equipment.
3. Confirm the patient's identity.
4. Explain the procedure and make sure informed consent has been obtained.
5. Check for the appropriate laboratory results and that the patient has been nothing-by-mouth (NPO) status for at least 8 hours.
6. Perform hand hygiene and put on gloves.
7. Remove any dentures or plates from the patient's mouth and remove any personal effects from the patient.
8. Have the patient change into a gown and void.
9. Check the patient's vital signs, including pulse oximetry.
10. Attach the patient to the electrocardiogram (ECG) monitor and electroconvulsive therapy (ECT) machine.
11. Run the ECT machine in self-test mode.
12. Monitor the patient's ECG and EEG strips.
13. Discontinue the I.V. infusion when spontaneous ventilation returns.
14. Position the patient on his side to maintain an open airway.
15. Assess the patient, and monitor his vital signs every 15 minutes until they're stable.
16. Discharge the patient from the recovery area, when appropriate.
17. Document the procedure.