

Auditing electroconvulsive therapy

The third cycle

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Background This is the third large-scale audit in the past 20 years and compares the practice of electroconvulsive therapy (ECT) in England and Wales with the standards derived from the Royal College of Psychiatrists' 2nd ECT handbook.

Method Facilities, equipment, practice, personnel and training were systematically evaluated during visits to all ECT clinics in the former North East Thames and East Anglia regions and Wales. All other English ECT clinics were surveyed with a postal questionnaire. Information was obtained for 184 (84%) of the 220 ECT clinics identified.

Results Although some aspects of ECT administration had improved since the last audit in 1991, overall only one-third of clinics were rated as meeting College standards. Only 16% of responsible consultants attended their ECT clinic weekly and only 6% had sessional time for ECT duties. Fifty-nine per cent of all clinics had machines of the type recommended by the College and 7% were still using machines considered outdated in 1989. Only about one-third of clinics had clear policies to help guide junior doctors to administer ECT effectively.

Conclusions Twenty years of activity by the Royal College of Psychiatrists and three large-scale audits have been associated with only modest improvement in local practice.

This paper reports the findings of a third audit of electroconvulsive therapy (ECT), which was conducted between September 1995 and July 1996.

PREVIOUS AUDITS OF ECT IN BRITAIN

The College first set standards for the administration of ECT in 1977 (Royal College of Psychiatrists, 1977). Pippard & Ellam (1981) subsequently conducted a review of practice by visiting 180 ECT clinics in the UK – about one-half of the total number. The audit revealed that some centres were using obsolete machines and that training of junior doctors in the administration of ECT was generally poor. In response to these findings the College produced its first ECT handbook in 1989 (Royal College of Psychiatrists, 1989).

In a second audit, Pippard (1992) evaluated the administration of ECT against standards contained in the 1989 handbook during visits to 35 National Health Service (NHS) and five private ECT clinics in the old North East Thames and East Anglia Regions. Although he reported an improvement since 1981 in the standard of ECT facilities and some aspects of practice, many clinics were still failing to meet the 1989 recommendations, particularly with regard to the training of junior doctors and the use of modern machines.

After his second evaluation, Pippard (1992) made a number of further recommendations. These focused on the role of the College and its members in ensuring that ECT clinics meet certain standards. These included the allocation of consultant sessions to administer and supervise ECT, accreditation of consultants in charge of ECT clinics, external inspection visits and better training of junior doctors.

The College established a working group to consider Pippard's suggestions and recent research findings. The revised

College recommendations related both to structures (including the quality of ECT suites and equipment for administering ECT and monitoring seizures) and to processes (the administration of the electrical current, management of anaesthesia and recovery, the training and supervision of personnel). These revised guidelines were disseminated in the 2nd ECT handbook (Royal College of Psychiatrists, 1995), a video for psychiatrists involved in administering ECT (400 had been sold by the autumn of 1996), two articles in a journal supporting continuing medical education of psychiatrists (Lock, 1994; Robertson & Fergusson, 1996) and a series of training courses organised by the College (about 300 psychiatrists had attended these by the autumn of 1996). Pippard's recommendations about external audit and accreditation were not, however, implemented.

THE THIRD AUDIT

Method

Two hundred and fifteen ECT clinics, and the consultant responsible for ECT, were identified by phoning all NHS mental health trusts in England and Wales. Private clinics in North Thames and East Anglia were also identified. There were two components to the audit:

- Visits by R.D. to all ECT clinics in the old North East Thames and East Anglia regions (the area covered by Pippard's second audit) and to all clinics in Wales;
- A postal questionnaire sent to consultant psychiatrists responsible for ECT in all other English NHS mental health services.

Component 1: visits to ECT clinics

All 33 NHS clinics in the North East Thames and East Anglia regions and 17 in Wales were visited by R.D. between September 1995 and July 1996. In addition, visits were made to the two private clinics in the North East Thames and East Anglia regions and to three private clinics in north-west London. Whenever possible, visits were made on a day when ECT was due to be given. Clinics were rated using a schedule of standards derived from the 1995 ECT handbook. Some standards, such as presence of adequate equipment could be rated simply as present or absent. The standards of rooms, personnel and training were given a summary rating of poor,

average or good and each clinic was also assigned a global rating using a similar scale. Each of these ratings took account of a number of factors (see Results). Similar methods were used to those employed by Pippard, who was consulted both on the design of the rating methods and on assigning ratings to individual clinics.

A total of 130 ECT treatments were observed in 40 (80%) of the NHS clinics and five treatments in three of the private clinics. During the sessions, observations were made about the testing of equipment, preparation of the patient, nursing care, stimulus used and the adequacy of medical records.

Component 2: the postal questionnaire

An eight-page postal questionnaire was sent to the consultant responsible for the 165 ECT clinics in England which were not visited as part of Component 1. The questionnaires were posted at the end of 1995 with a second mailing made to non-responders in spring 1996. The questionnaire was also completed by 10 of the consultants whose units were visited.

RESULTS

Returns were received from 129 of the 165 clinics in Component 2. Thus, data were available from 184 of the 220 clinics identified (response rate of 84%). Comparison of information from the 10 clinics which completed both the postal questionnaire and received a visit suggested that the two approaches yielded results which were sufficiently similar for the data from both methods to be combined; this is done in the Results, where possible. The relevant standards (derived from Royal College of Psychiatrists (1995)) are displayed at the beginning of each Results sub-section.

The ECT suite

ECT suites should consist of separate waiting room, treatment room and recovery room, and be warm, clean and of an adequate size. Clinics should provide a separate office for staff and a further recovery area for patients when they no longer need to be on the treatment trolley

An overview of the results is presented in Table 1. None of the NHS clinics wheeled the ECT machine from cubicle to cubicle, as had been found previously, and a further recovery area was provided by 46% of services. Four of the private clinics administered ECT in patient rooms and as such

did not have a separate waiting and recovery room. Despite the improvements, the quality of the environment in which ECT was administered varied widely; while some services had neglected the fabric of their ECT suite for many years, others provided a very well-maintained facility.

Equipment

ECT machines should be capable of a wide range of current settings (machines from four manufacturers are recommended in the 1995 handbook).

Recent research has shown that the minimum current required to induce a seizure may vary up to 40-fold between patients (although a narrower range is often found in ordinary clinical practice; Lock, 1994). The latest College handbook therefore recommends machines which deliver at least a 14-fold range of currents. By 1996, 108 clinics (59%) had installed these 'state of the art' machines (see Table 2). About one-third of clinics were using the Ectron 5 which can deliver a less than three-fold range of current and so limits the ability to titrate the current delivered. Twelve clinics (7%) were still using machines that were no longer recommended in the 1989 handbook. These older machines are under-powered, deliver a very restricted range of current and do not record the current actually delivered.

Anaesthetic equipment should include tilt trolleys, suction facilities, a supply of oxygen in the recovery and treatment rooms, electrocardiograms, pulse oximeters and capnographs.

Only two services visited provided capnographs and nine did not have tilt trolleys, otherwise these standards were generally well met; 21 clinics (41%) had pulse oximeters in both the treatment and recovery room.

Personnel, supervision and training

The consultant psychiatrist responsible for ECT should attend the clinic regularly and be acquainted with College recommendations on ECT practice.

In all services a named consultant psychiatrist was identified as being responsible for

the ECT clinic. Of the clinics visited only three consultants (6%) had sessional time allocated specifically for ECT. For the remainder, the times at which ECT was given often conflicted with other fixed commitments such as ward rounds and out-patient clinics. Twenty (36%) had read the 1995 ECT handbook and 23 consultants in the clinics visited (42%) had personally attended the ECT training course run by the College. In five (9%) of the clinics visited the consultants never attended ECT sessions; in 18 (33%) the consultant attended on average every 2–6 months; in 23 (42%) once a month and in nine (16%) once a week. In only three clinics did the consultant or another senior doctor, administer treatment routinely, and junior doctors attend principally for training purposes. The respondents to the postal survey reported spending on average three hours a month devoted to ECT (range 0–20). Sixty-six per cent of respondents to the postal questionnaire ($n=85$) claimed to have read the College handbook.

Junior doctors should observe ECT being given before they administer it themselves and should be supervised for the first few treatments they administer by a psychiatrist who has passed the Membership examination.

The issue of junior doctor involvement in ECT, their training and supervision is reported more fully elsewhere (Duffett & Lelliott, 1997). In brief, junior psychiatrists usually give ECT; all but four of the 184 clinics included senior house officers and registrars in psychiatry on the roster to give ECT and 140 (76%) included general practice vocational trainees. The College does not encourage the latter practice.

Anaesthetists should be sufficiently trained and experienced to manage any complication likely to arise during ECT administration (particularly if ECT is given at a site without an anaesthetic department). Rosters should include a consultant anaesthetist and be arranged to provide some continuity of care for patients over their course of treatment.

Standards relating to anaesthetic practice were derived from the College's ECT handbook and measures agreed with a

Table 1 Standards of rooms in the ECT suite

	Visited sites (%) $n=55$	Rest of England (%) $n=129$	Total (%) $n=184$
Good	14 (25)	47 (36)	61 (33)
Deficient in some areas	27 (49)	73 (57)	100 (54)
Poor	14 (25)	9 (7)	23 (13)

Table 2 ECT machines in use

ECT machines in use	Visited sites (%) n=55	Rest of England (%) n=129	Total (%) n=184
Thymatron ¹	9 (16)	24 (18)	33 (18)
Mecta ¹	3 (5)	18 (12)	21 (11)
Neurotronics ¹	1 (2)	8 (6)	9 (5)
Ectron 5 a/b ¹	12 (22)	33 (24)	45 (24)
Ectron 5	27 (49)	37 (26)	64 (34)
Older Ectrons	3 (5)	9 (7)	12 (7)

1. Currently recommended by the Royal College of Psychiatrists.

Council representative from the Royal College of Anaesthetists. In only four services visited (7%) was anaesthetic input rated as poor, either due to the inexperience of staff or to a failure to provide regular cover. Eight clinics (15%), however, reported experiencing difficulty in obtaining anaesthetic cover at least once a month resulting in cancelled clinics or the need to transport patients between hospitals.

Visited clinics located in district general hospitals and teaching hospitals ($n=23$) more frequently included junior anaesthetists (senior house officers and registrars) on the ECT roster than those located elsewhere ($n=32$), 65% *v.* 9% $\chi^2=16$, $P<0.001$. For 68% of all clinics ($n=126$) anaesthesia was administered by a consultant anaesthetist for at least one session a week. No senior house officers administered anaesthesia for ECT in a setting outside of a district general or teaching hospital unsupervised. An operating department assistant was available in 88 (48%).

Nursing staff should be familiar with ECT procedures and trained in recovery techniques. There should be at least one senior nurse with special responsibility for ECT who is supported during the clinic by additional appropriately trained staff.

The quality of nursing input to the clinic varied greatly. When staff had sessional time allocated for ECT, nurses were keen to ensure high standards and in some services routinely met patients prior to them starting a course of ECT. In 23 clinics visited (42%) the senior nurse was dual trained (Registered Mental Nurse and State Registered Nurse), although many others had gained experience recovering patients in the theatre recovery area of general hospitals. However, many of the other nursing staff accompanying patients, and involved in patient recovery, were not as highly trained.

Policies and procedures

There must be policies giving guidance on what settings to use to stimulate patients, what to do in the absence of a seizure and when to terminate a prolonged seizure.

ECT is a relatively simple and circumscribed medical procedure, and is a good subject for locally developed structured protocols for its administration. Despite this, 36 of the clinics visited (67%) lacked any clear written stimulation policy, 35 (65%) gave no written guidance on re-stimulating patients with short seizures and 48 (89%) gave no guidance on terminating prolonged seizures. Of the clinics visited, 13 (24%) had ECT recording forms which were judged to be inadequate.

Observed treatment sessions

Patient preparation and delivery of treatment

Consistent with College recommendations, only nine (7%) of the 130 patients (47 men, 83 women) observed being treated received unilateral ECT. Twenty-one patients ($n=21$, 16%) were detained under Sections of the 1983 Mental Health Act, with 17 (13%) being given ECT against their will under the provisions of Sections 62 or 58.

Propofol was used as the induction agent for 22 patients (17%) (while there is no clear evidence that this compound impedes the efficacy of ECT, its use is not recommended either by the manufacturers or the 1995 ECT handbook). In response to the first stimulus, 21 patients (16%) had a seizure duration of 14 seconds or less, 11 of whom (8%) appeared to have no seizure. All but one of the 13 patients with a seizure duration below 10 seconds were re-stimulated, although not always on a high enough setting. No patient was stimulated more than twice during the same session. Seizures were generally timed appropriately with 21% ($n=27$) monitored using an electroencephalogram (EEG), 8% ($n=10$)

using the Hamilton cuff technique and 71% ($n=93$) relying on naked eye observation of the modified seizure. The recorded mean length of seizure activity when EEG monitoring was used was longer than when it was not (37 *v.* 29 seconds; Mann-Whitney, $P<0.05$).

Only 14 clinics (36%) followed the recommendation that someone other than the doctor holding the electrodes should trigger the stimulus. In two clinics the administering doctor removed live electrodes early from the patient's head.

The College recommends that patients receiving ECT should be subject to regular review. However, no information had been recorded on mental state in the preceding week for 32 patients (25%) and for only 67 (52%) had an entry in the case notes been made since the last ECT treatment (or the last week, if this was shorter). Stimulus settings and duration of seizure were adequately recorded.

Punctuality and staffing

In the services visited all patients were either accompanied to the ECT clinic or treated by a staff member who knew them. The level of support patients received while in the treatment room was generally high, with nursing staff in particular endeavouring to minimise the distress associated with the procedure. However, in two clinics the level of reassurance and support patients received was poor, with patients left lying on a trolley unattended while staff members busied themselves with 'other duties'. Although the majority of clinics started on time, 10 (23%) started more than 20 minutes late. The most common cause of a delay in starting was late arrival of medical staff.

Overall performance of clinics

Table 3 shows summary ratings of the quality of aspects of facilities and staffing. The global rating took account of facilities, personnel and how smoothly the clinic ran and were influenced by the level of patient care and the effectiveness of the observed ECT session. It was therefore a better rating of the quality of clinics where treatment was actually observed. R.D.'s view was that, had he required it, he would have been reluctant to receive ECT in 13 of the clinics visited (24%).

Impact of the College initiative

Consultants responsible for 147 (80%) of all clinics surveyed reported that they had seen the College video. In the clinics visited, 17 of the 23 consultants (74%) who had attended the one-day training course run by the College had also read the 1995 handbook compared with only three (9%) in the 32 clinics where the consultant had not attended the course ($\chi^2=24$, $P<0.001$). The overall performance of clinics whose consultants had attended the course was rated better than those where the consultant had not and none of the former received a poor rating; this association was statistically significant ($P<0.05$).

Although some of its recommendations related to nursing practice, in only 21 of the clinics visited (38%) had any nursing staff heard of the handbook.

DISCUSSION

Problems of multi-centre audits

This project illustrates some of the problems of conducting a multi-centre clinical audit. Whenever possible the standards, which were derived from the lengthy handbook, were converted into a format which facilitated measurement. Some, however, such as those relating to the adequacy of rooms, required subjective judgement to be made. The use of a single rater means that ratings were likely to have been made in a consistent way in all the clinics visited, and the involvement of Dr Pippard means that some comparisons can be made with his findings from 1991.

Changes since the previous audit

There has been improvement between 1991 and 1996 in some aspects of ECT administration. ECT machines are no longer wheeled from patient to patient (evident

in three clinics in the 1991 audit), operating department assistants have been introduced and further recovery areas made available for patients prior to them returning to their ward. ECT machines pre-dating the Ectron 5 (used by 46% of clinics in 1991) have been largely phased out. Fewer of the consultants responsible for ECT had never visited the clinic during its operation (9% *v.* 40% in 1991) and the number of services where anaesthetic practice was rated as poor has fallen from 28% to 7%.

Problems of implementation of ECT guidelines

The extent to which the slow improvement in ECT practice can be attributed to the College's actions could only have been gauged by a prospective, controlled study which, even if methodologically possible, would have been prohibitively expensive. There is, however, circumstantial evidence that the activities of the College over the years have had some impact. Consultants who had attended the College course had better clinics (although consultants keen to raise standards are probably also more likely to attend the College course). Also, staff in good clinics often attributed their high standards to following the College recommendations and reported using the results of the 1991 audit to argue for resources to improve facilities.

Although the 1996 audit was conducted only a few months after the publication of the ECT handbook, it is disappointing that only one-third of the consultants in the clinics visited had actually read it, most of whom had also attended the College course. Dissemination of the College recommendations across professional boundaries was also poor, with two-thirds of senior nurses in ECT clinics not even aware of the handbook's existence (despite liaison with the Royal College of Nursing at the time the standards were set). The College video had been more widely circulated, having been seen by more than one-half of junior doctors administering ECT (Duffett & Lelliott, 1997) and about 80% of consultants.

It is known that even after well-planned dissemination, guidelines frequently reach only a small proportion of their target audience (Grol, 1992; Lomas, 1993). The College ECT initiative is consistent with what is known about effective dissemination of guidelines in that it included presentation through a variety of media

(video, workshops, a handbook, papers in peer review journals and journals of continuing professional development), interventions targeted at the key audience (the ECT course for responsible consultants) and the involvement of respected colleagues (in teaching and promoting good practice; Lomas, 1993).

However, even if the handbook were to reach all of its intended audience it would not necessarily lead to change of practice. Its weakness, common to other national initiatives, is that it was developed 'top-down' and so may not be 'owned' by those to whose practice it relates (Grimshaw & Russell, 1993).

Options for accreditation

Given the number of clinics which do not meet standards the question has to be asked as to when sanctions should replace exhortation and education. In the USA, the American Psychiatric Association requires a psychiatrist to receive special training and accreditation before giving ECT unsupervised (American Psychiatric Association, 1990). If applied in the UK, this would end the practice of junior doctors, who might be in their first psychiatric post, being assigned to ECT rosters simply on the basis of their availability for this duty.

Alternatively, accreditation could apply to the whole process of ECT administration including facilities, equipment, practice, personnel, supervision and training. Although ECT facilities are inspected at College visits to accredit training schemes, this has not assured uniformly high standards to date. It is likely that the detailed inspection required for accreditation of ECT clinics would have to be conducted as a separate activity. There is a precedent; Clinical Pathology Accreditation (UK) Ltd started by the Royal College of Pathologists has been accrediting departments of clinical pathology since 1992. Although accreditation is not statutory, increasingly health authorities will only commission services from accredited departments.

CURRENT STANDARDS IN ECT

Many aspects of the organisation and administration of ECT improved between 1991 and 1996. Very old ECT machines have largely been replaced, senior psychiatrists are more actively involved and anaesthetic input is better. However, two-thirds

Table 3 Summary ratings of the 55 clinics visited

	Poor (%)	Average (%)	Good (%)
ECT suite	14 (25.5)	27 (49)	14 (25.5)
ECT/anaesthetic equipment	5 (9)	31 (56)	19 (34)
Psychiatric staff	10 (18)	34 (62)	11 (20)
Anaesthetic staff	4 (7)	30 (56)	20 (37)
Nursing staff	11 (20)	23 (42)	21 (38)

of ECT clinics fall short of the most recent College standards, particularly in relation to the frequency of consultant attendance and the training of junior doctors. These problems have not been fully resolved by 20 years of audit and College activity. There should be a continuing debate as to what further interventions might be considered.

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CLINICAL IMPLICATIONS

- Only one-third of ECT clinics in England and Wales can be regarded as good. Local clinicians should work with managers to improve the quality of clinics and instigate regular local audit.
- Many consultants responsible for ECT devote less time to this activity than is recommended by the Royal College of Psychiatrists.
- After more than 20 years of College activity to improve standards, including three large-scale audits, consideration might be given to a system of accreditation.

LIMITATIONS

- The audit began only a few months after publication of the standards on which it was based.
- A postal questionnaire supplemented data collected on site visits; the national picture is based on a combination of the two data sets.
- Many ratings relied on the subjective view of the author who visited the clinics.

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