

ratification, but would be a complex and time consuming process for the care coordinator.

User involvement is a difficult concept to quantify, although users were involved in devising the key indicators used. There is clearly a need for the development of valid and reliable measures of user involvement. This study is also limited by its relatively small sample. Due to the significant differences found between the study and non-study group, the 61% of users who participated are unlikely to be representative. There is a known association between substance misuse, which is significantly more prevalent in the non study group, and poor engagement with services (Sparr *et al.* 1993). Those who did not attend review meetings may feel less involved with their care. Physical disabilities, which were significantly more common in the non-study group, may have contributed to non-attendance. The focus of the study on the aftermath of CPA meetings had the advantage of immediacy and good recall, but may not have allowed users time to reflect on what happened during the meeting.

#### Acknowledgements

We thank S. Garrett, P. Skarratt, S. Norman, J. Saunders and R. Echlin for their help and support.

#### References

- AVON MENTAL HEALTH MEASURE WORKING GROUP (1996) *The Avon Mental Health Measure: A User-Centred Approach of Assessing Need*. Bristol: Bristol Social Services.
- CARSON, J. & SHARMA, T. (1994) In-patient psychiatric care: What helps? Staff and patient perspectives. *Journal of Mental Health (UK)*, **3**, 99–104.
- DEPARTMENT OF HEALTH (1990) *The Care Programme Approach for People with a Mental Illness Referred to Specialist Psychiatric Services*. London: HMSO.
- GUY, W. (1976) *ECDEU Assessment Manual for Psychopharmacology*. Revised DHEW pub. no. (ADM) 78–388. Rockville, MD: National Institute of Mental Health.
- SPARR, L. F., MOFFITT, M. C. & WARD, M. F. (1993) Missed psychiatric appointments: who returns and who stays away. *American Journal of Psychiatry*, **150**, 801–805.
- WORLD HEALTH ORGANIZATION (1992) *The Tenth Revision of the International Classification of Diseases and Related Health Problems*. Geneva: WHO.

Michael Lawson, Assistant Psychologist; \*Paul Wolfson, Consultant Psychiatrist, Oxleas NHS Trust, Bexley Hospital, Kent DA5 2BW; and Chrissie Strickland, Director of MIND, Bexley, Kent

\*Correspondence

## Audit of a recently introduced stimulus dosing policy in an electroconvulsive therapy clinic

G. Shaikh, R. Ireland, M. McBreen and R. Ramana

**Aims and method** To audit the clinical practice of seizure threshold estimation and subsequent stimulus dose adjustment in the electroconvulsive therapy (ECT) clinic. Case notes of patients who had ECT over a six-month period were audited. Results were discussed at an audit meeting and guidelines and training modified appropriately prior to the second cycle of the audit.

**Results** Initial dose titration was poor in the first period, but improved in the second. The majority of patients were insufficiently stimulated after missed seizures in both periods and stimulus doses were not being

reduced following prolonged seizures.

**Clinical implications** The audit identified the need for continuing supervision of trainees in addition to clear training and guidelines.

Electroconvulsive therapy (ECT) is a recognised and effective treatment for severe depression. A response to treatment requires a moderately supra-threshold stimulus. Doses marginally above the seizure threshold do not have a

therapeutic effect while grossly supra-threshold stimuli lead to increased cognitive side-effects without increased clinical improvement (Ottoson, 1960; Sackeim *et al.*, 1993). There are large individual differences in seizure threshold. Sackeim *et al.* (1987) showed that seizure threshold ranged between 25 mC and 800 mC or more in their patient population, that is, a 40-fold inter-individual variation. Intra-individual changes in threshold of between 25 and 200% can also occur during a course of ECT (Sackeim *et al.*, 1991).

A significant development in ECT practice has been the introduction of stimulus dosing. Prior to this the use of fixed dose strategies inevitably led to over-stimulation and cognitive side-effects in some patients or sub-therapeutic stimulation in others. Stimulus dosing allows us to set individually tailored, moderately supra-threshold stimulus doses and to adjust subsequent dose settings as seizure threshold rises. Pippard (1992) proposed that stimulus dosing should become standard UK practice following his influential ECT audit.

Stimulus dosing was introduced at Fulbourn hospital, Cambridge in August 1996. Junior doctors administering ECT underwent initial training with the ECT consultant (R.R.), who has sole responsibility for training and consultant responsibility for the clinic. Continuing consultant or senior registrar supervision was then provided for at least one session weekly. Clinical practice in the six months following the introduction of the new protocol was audited. The results were presented at an audit meeting. The second cycle of the audit was completed in a further six-month period.

### The study

The medical notes of all patients who started a course of ECT in Fulbourn hospital between October 1996 and March 1997 (Period A) were audited. The results of the audit were presented to the multi-disciplinary hospital audit meeting. Standards were discussed and methods of improving practice suggested. Revised guidelines were circulated to all interested parties, new training initiatives implemented and changes in documentation introduced. Practice was reassessed in the six-month period July 1997–October 1997 (Period B).

### Standards

We set seven standards, derived from *The ECT Handbook* (Royal College of Psychiatrists, 1995), relating to the three stages of stimulus dosing: patient preparation (Standard 1), empirical dose

titration (Standards 2–4) and subsequent dose adjustment (Standards 5–7).

- (a) Factors affecting seizure threshold should be recorded in the ECT prescription sheet.
- (b) Initial stimulus settings should be chosen in accordance with protocol on the basis of age, gender, recent ECT and anticonvulsant medication.
- (c) When determining seizure threshold, restimulation settings should be in accordance with the protocol.
- (d) Seizure threshold should be determined in the first treatment session in 75% of cases, and by the second session in 100% of cases.
- (e) Dose settings should be 1.5 times seizure threshold in the case of bilateral ECT and 2.5 times threshold for unilateral ECT.
- (f) Stimulus intensity should be increased appropriately where there is evidence of rising seizure threshold.
- (g) In the event of a missed or brief seizure, appropriate restimulation should occur as outlined in the protocol.

### Patient sample

Twenty patients were identified from Period A and 26 from Period B. Both groups were similar in terms of demographic and basic clinical data. Approximately twice as many females as males underwent ECT in both periods. In Period A the ratio of male to female was 1:2.3. In Period B it was 1:1.9. The mean number of treatments given in period A was seven with a range of 1–16. In period B the mean number was seven with a range of 1–14.

### Results (see Table 1)

The percentage of correctly chosen initial stimulus settings was high in both periods. Incorrect setting choice appeared to be due to minor errors rather than a lack of understanding of the protocol. Restimulation setting choice during dose titration was correct in only 43% of cases in Period A. This increased to 80% in Period B. The correct setting for first application after dose titration was chosen in 50% of cases in Period A and only increased to 60% in Period B. Guidelines for correct restimulation for missed or brief seizures were followed in only 50% (six out of 12) of cases in Period A. This figure went down to 42% (five out of 12) in Period B. The stimulus setting was reduced after a prolonged seizure (45 seconds or above) in only 35% (six out of 17) of cases in Period A and 36% (four out of 11) in Period B.

Table 1. Sample details and results

	Period A	Period B
Number of patients	20	26
Mean age (years)	53	55
ICD-10 diagnosis		
Unipolar depression	13	18
Bipolar depression	3	6
Schizophrenia	3	2
Personality disorder	1	0
Mental Health Act status		
Informal	12	14
Formal, consenting	3	5
Formal, not consenting	5	7
Patient status		
In-patient	18	22
Out-patient	2	4
Electrode placement		
Bilateral	19	25
Unilateral	1	1
Factors affecting seizure threshold recorded	78%	77%
Initial stimulus setting chosen correctly	83%	83%
Restimulation settings chosen correctly for empirical dose titration	43%	80%
Seizure threshold identified in first session	94%	72%
Moderate supra-threshold settings correctly chosen for subsequent sessions	50%	60%
Setting adjusted as seizure threshold rose	80%	90%
Correct restimulation for missed or brief seizures	50%	42%
Setting reduced after prolonged seizure (>45 sec)	35%	36%

### Comments

Our stimulus dosing policy was introduced to ensure that each patient received the lowest possible therapeutic dose thus reducing the likelihood of cognitive side-effects. Although the protocol was mostly followed correctly clinicians appeared unwilling to sufficiently increase stimulus dose following inadequate seizures. We also found that clinical judgement was not used to reduce stimulus settings after prolonged seizures. The latter was not specifically

mentioned in the protocol but was included in the training sessions. In one case, following a 70 second seizure subsequent stimulation continued at the same dose. A new protocol is being prepared, which will contain explicit instructions on these areas. Our audit shows that regular senior supervision is required for stimulus dosing to be used effectively despite clear guidelines and training.

### Acknowledgements

We are grateful to Trish Braybrooke and her team at the ECT clinic for their help with the audit.

### References

- OTTOSON, J. O. (1960) Experimental studies of the mode of electroconvulsive therapy. *Acta Psychiatrica Scandinavica*, **35** (suppl. 145), 1-141.
- PIPPARD, J. (1992) Audit of electroconvulsive treatment in two National Health Service regions. *British Journal of Psychiatry*, **160**, 621-637.
- ROYAL COLLEGE OF PSYCHIATRISTS (1995) *The ECT Handbook. The Second Report of the Royal College of Psychiatrists, Special Committee on ECT*. Council Report CR39. (ed. C. P. Freeman). London: Royal College of Psychiatrists.
- SACKEIM, H. A., DECINA, P., PROHOVNIK, I., *et al* (1987) Seizure threshold in electroconvulsive therapy: affects of age, sex, electrode placement and number of treatments. *Archives of General Psychiatry*, **44**, 355-360.
- , H. A., DEVANAND, D. P. & PRUDIC, J. (1991) Stimulus intensity, seizure threshold and seizure duration, impact on efficacy and safety of electroconvulsive therapy. *Psychiatric Clinics of North America*, **14**, 803-839.
- , PRUDIC, J., DEVANAND, D. P., *et al* (1993) Effects of stimulus intensity and electrode placement on the efficacy and cognitive side-effects of electroconvulsive therapy. *New England Journal of Medicine*, **328**, 839-846.

G. Shaikh, Senior House Officer, Shelton Hospital, Bicton Heath, SY3 8DN; R. Ireland, Specialist Registrar, Department of Psychiatry, West Suffolk Hospital, Hardwick Lane, Bury St Edmunds IP3 2QZ; M. McBreen, Formerly Clinical Audit Coordinator, Mental Health Services, Fulbourn Hospital, Cambridge, CB1 5EF; and \*R. Ramana, Consultant Psychiatrist, Box 351, Fulbourn Hospital, Fulbourn, Cambridge CB1 5EE

\*Correspondence