author to think about the measurement of feelings, and who have collaborated in enquiries.

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Measurement of Mood

Since a person's feelings are, by their very nature, inaccessible to objective scrutiny, it follows that measurement of mood depends to a large extent upon communication by the subject to the observer. When mood lies beyond an arbitrary limit of normality, illness has supervened; diagnosis is then a matter of opinion, based on clinical experience. Having diagnosed an anomaly of mood – be it depression, euphoria or other – it is then desirable to quantify that condition; this will allow observation of intrasubject changes, especially as a result of treatment, and also intersubject comparisons.

Hence there has been interest, particularly in recent years, to develop rating scales of mood; so far, there are two main types – self-rating (or self-description) (Beck *et al.* 1961, Lubin 1965, Shapiro 1961, Zung 1965) and observer-rating (Hamilton 1960, 1967, Medical Research Council 1965). The former avoid professional preconception and prejudice, but require both co-operation and a degree of verbal sophistication on the patient's part. The other type relies entirely on the clinical experience and skill of the staff rater.

In this country, the rating scale introduced by Hamilton (1960) is widely used. It exemplifies attempts to identify 'components' of illness syndromes by factor analysis of clinical ratings (Friedman *et al.* 1963, Kiloh & Garside 1963, Overall 1963): seventeen such 'components' are rated on either three- or five-point scales, preferably by two experienced raters working independently at the same interview. The procedure may take half-an-hour, and is unsuitable for use oftener than once a week.

In a recent report to the Medical Research Council (1965) by its Clinical Psychiatry Committee on the treatment of depressive illness, assessment was carried out using items taken from the Hamilton scale; however, the most important conclusion was based on *overall* ratings of depression by the psychiatrists on a simple five-point scale. It can be assumed with justification that this method of assessment was the one regarded as most appropriate by leading British psychiatric opinion; and accordingly similar ratings were made each week in the studies now to be mentioned, in parallel with patient self-ratings twice daily using a visual analogue scale (Aitken 1969). This scale provides the patient with a language by which to communicate his feelings frequently; its scores are amenable to parametric statistics, allowing precise examination of the significance of any differences.

Clinical Studies of a Visual Analogue Scale in Depressive Illness

In the first instance we examined a broad selection of depressed patients admitted to the Royal Edinburgh Hospital; each patient was asked to mark a horizontal 100 mm line, the ends of which represented normal mood and the extreme of depression respectively. Completion of a fresh recording slip at 12-hourly intervals (morning and evening) throughout their stay in hospital was easily achieved by arranging for the nurse to hand the slip to the patient at 'medicine round' times: it was collected forthwith, as only seconds were required to mark it. No patient failed to grasp the analogue concept of the line.

This technique allowed frequent estimation of the patient's feeling state with minimal inconvenience to himself and to staff, and with likelihood of early detection of change in condition, and subsequent analysis of its significance. In comparison with all the depression-rating techniques described earlier, this method has the advantage of not asking the patient to review his emotional status under numerous – and often

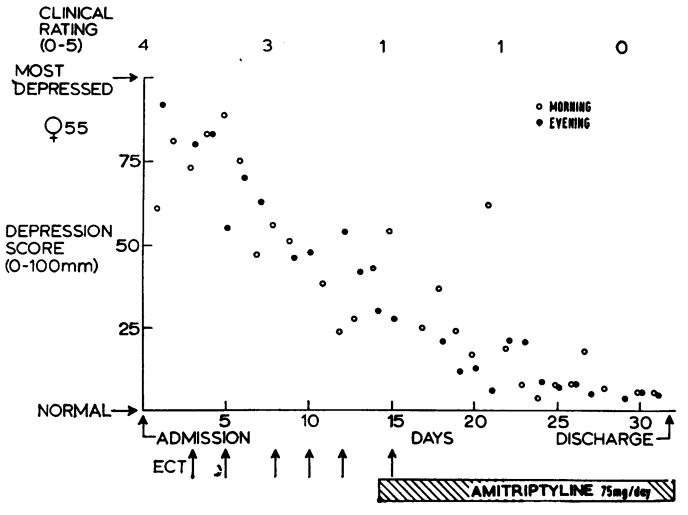

Fig 1 **Case 1** *Measurement of mood*

painful – headings: no other technique can sample the patient's mood frequently, simply and with such little distress, and yet enable estimation of the significance of any change.

Case 1 A married woman of 55 developed a severe depression with few precipitating factors, culminating in a suicidal attempt with both drugs and coal-gas. She responded well to electroconvulsive therapy and amitriptyline: the evolution of the illness was entirely satisfactory, proceeding to full recovery within a month (Fig 1).

Case 2 A 47-year-old engine driver with no previous psychiatric history was admitted with an endogenous depressive illness which he initially represented on the analogue scale as of only moderate severitiy (Fig 2). However, his condition worsened, and at the end of the first week in hospital, his line markings were consistently at the 'most depressed' end. Electroconvulsive therapy was started, and improvement went ahead in two stages, being complete only when the last of the six treatments had been given.

For each of the 13 patients in this study, all morning and evening line marking scores were plotted against time; they were then subjected to separate morning and evening regression analyses, for periods appropriate to clinical events. The results of Case 2 will be considered here as an example of analysis in two separate periods. Fig 3 shows that the worsening clinical state was most pronounced in terms of morning depression scores: the morning variance was only half that of the evening. From Day 10 onwards, there was little difference in either level or slope of the regression lines, and negligible diurnal variation.

In no patient yet observed by us have we found a significant difference between morning and evening scores in level or in rate of change. In other words, we have not observed classical 'diurnal variation' by measurement of feeling. Difference in variance was quite common; it revealed a form of 'diurnal variation' in the sense that morning self-ratings of mood showed only

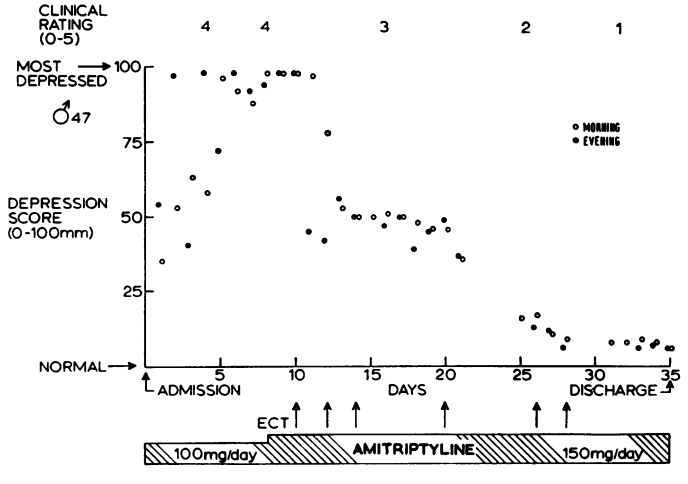

Fig 2 **Case 2** *Measurement of mood*

Table 1
Correlation coefficients between methods of assessment of depression

	On admission N=13	*Midway N=13*	*On discharge N=7*
Analogue scale *v.* Hamilton score	0·79■	—0·06	—0·06
Analogue scale *v.* overall category	0·78■	0·36	0·13
Hamilton score *v.* overall category	0·90■	0·76●	0·55

● P=0·01
■ P=0·001

moderate variability, whereas the diverse events of successive days in hospital had a clear dynamic effect on how the patient felt by evening.

Correlations between the three methods of assessment of depression used in this study – visual analogue scale score taken from regression equation, Hamilton score and psychiatrists' overall rating – are shown in Table 1. Whereas there is good correlation on admission, it is perhaps not surprising that this disappeared by time of discharge since one was then trying to estimate an almost non-existent phenomenon.

Examination of Manic-depressive Illness

A similar mood-recording method was used in a second study, though the 100 mm line was now labelled 'most depressed' at one end and 'most happy' at the other – the mid-point being designated 'normal'. In-patients with a known tendency to both manic and depressive mood swings were asked to mark the line twice daily, and similar recordings were made independently by ward nursing staff.

These parallel records illustrate at least two possible anomalies of nurse-patient communication. First, the patient's gradual swing from depression, through normality to hypomania may be discerned by the nurse only after several days' delay, resulting in a 'phase shift' between the patient and nurse analogue score curves (Fig 4). A second tendency in other patients was for the nurse to be patently unaware of the patient's feeling state day by day, indicated by a clustering of nurses' line scores around the centre point.

In both these situations, it is clear that the patient was the better guide to his affective state than the nurse. Since psychiatric treatment is largely directed towards symptom relief, due weight should be given to the validity and immediacy of the patient's record.

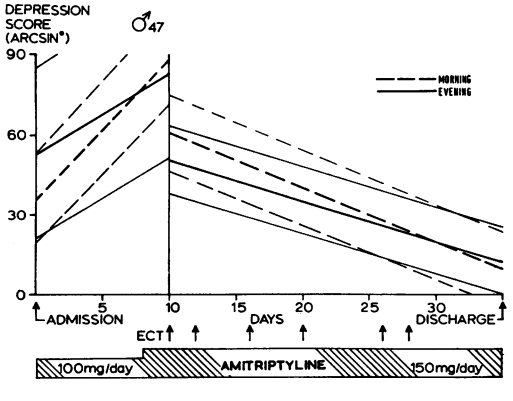

Fig 3 **Case 2.** *Regression analyses of visual analogue scale scores. The thicker lines represent the equations, and the thinner lines the 95% confidence limits*

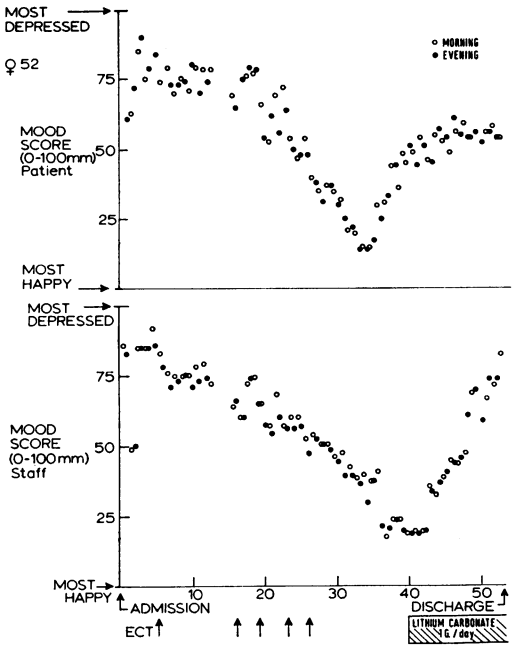

Fig 4 *Visual analogue scale scores obtained from nursing staff and patient with manic-depressive illness*

Clinical Trial of Antidepressant Drugs

A third study for which this method of mood measurement seemed relevant was prompted by claims that a new antidepressant drug (protriptyline) had an earlier onset of action than the usual two weeks or so said to be necessary for existing tricyclic drugs. Ten depressed outpatients were allocated randomly to either the new or a well-accepted antidepressant drug (imipramine) on a double-blind basis; they were given booklets of fourteen slips, enough for a week's twice-daily marking of 100 mm 'normal – most depressed' lines. After each occasion of marking, the slip was torn off and placed in an envelope for collection at each weekly review.

Regression equations were completed for each patient for the first fortnight's treatment, and a common regression was calculated separately for patients on the new and on the established drug. The slope (i.e. subjective improvement) for imipramine was highly significant, while there was no significant slope for protriptyline. The claim that protriptyline acts faster than imipramine cannot therefore be sustained on this evidence, obtained after preliminary analysis of scores which represented the patients' feelings.

Conclusions

The use of a visual analogue scale for the assessment of mood in depressed patients has been shown to be practical, reliable and valid. It is particularly suitable for the measurement of change, and observation of its significance. Its limitations are no more than in the use of any language to communicate feelings from the patient to the observer; in our opinion, its limitations are less than for other available methods.

Acknowledgments: Appreciation is expressed to Dr J W Affleck and Dr G Ashcroft for permission to study patients under their clinical charge.

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Dr Raymond Levy (*Academic Department of Psychiatry, Middlesex Hospital Medical School, London*) said that Dr Aitken and Dr Zealley had shown how self-rating analogue scales might be used to produce results which appeared to have some form of face validity. However, he thought that they had underestimated the difficulties involved in the use of such scales. Insufficient attention had been paid to the wording of questions and to the complex ways in which increased psychiatric contact would alter the way in which patients expressed their feelings. Patients seldom used words such as 'anxiety' and 'depression' to describe their feelings when first going to see a doctor but would tend to do so increasingly as they became more psychiatrically sophisticated. He suspected that scales such as these were useful mainly in assessing patients with moderately severe symptoms who knew exactly what the doctor meant and who happened to use the same terminology. Both mildly and severely depressed patients found it difficult to use such scales. These problems had been highlighted for him by two examples which had occurred in a recent study using very similar scales. One patient who had been weeping after being left by her boy friend had rated herself as not depressed but said that she felt 'very miserable and low'. Another patient with a severe involutional melancholia associated with self-depreciation had also rated himself as not depressed because he considered that he was not ill but 'just wicked and evil'. These difficulties, although not insuperable, severely limited the use of self-rating scales in this field.

Dr J P Watson (*The Maudsley Hospital, London*) thought the problems of the definition of terms and of scales encountered by Dr Aitken were no different from those implicit in the use of any rating scale. He wondered if Dr Aitken had any evidence of patients deliberately giving scores consciously known by them to be false.

Dr Aitken replied that Dr Levy's point was an important one, but he agreed with Dr Watson that it applied to all forms of self-rating. In his experience, patients nowadays use spontaneously words such as depression – but undoubtedly their words may mean something quite different to what psychiatrists mean when they use them. Clarification of the exact nature of a symptom is required, as it is in clinical assessment of all symptoms. Analogue scales can quantify sensitively what patients wish to convey, but not what the doctor would like his words to mean.

Dr Aitken said that they had found that the majority of patients used the scale to convey what seemed appropriate. However, one patient had consistently marked the line as moderately depressed, when patently he did not suffer from depressive illness. He was sociopathic; there were clear reasons why he might have wished to convey continuation of a distressed feeling but whether or not this was wilful deception necessitated judgment of insight, which was as debatable as it often is in this diagnosis. The important point was that what he communicated seemed to reflect accurately what he felt, which was helpful in clinical management.

The following paper was also read:

The Measurement of Vertigo
Dr A J Benson
(*RAF Institute of Aviation Medicine, Farnborough, Hampshire*)