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Visual analogue scales

SIR, Although the visual analogue scale (VAS) is widely used in rheumatology, especially for the measurement of pain, its use and interpretation require care. It has recently been suggested¹ that patients using it are unconsciously influenced by the so-called 'golden section', estimating short below 6.19 cm along the scale and long above that distance. As the methodology of the study which suggested this was not typical of clinical use of the VAS, we asked 100 patients attending the physiotherapy department in South Tees to estimate their pain on a vertical VAS on arrival at the treatment unit. They were then prepared for treatment, and before therapy was commenced filled in a second VAS without having sight of their first scale. When the results of the first and second measurements were compared, 52% of the second estimates fell short, 17% were equal, and 31% were longer than the first. The results are summarised in Table 1. When results from patients whose original score was 6 cm or less were compared with those between 6.1 cm and 10 cm, no significant difference was found between the 2 groups (Table 2).

Scott and Huskisson² suggested that patients who are not allowed to see their original score tend to over-estimate at a second attempt. Our findings do not accord with theirs, as 52% of our patients gave a smaller estimate on their second attempt, only 31% increasing.

Although we agree with Dixon and Bird¹ that reproducibility is best near the ends of the scale, we did not find the change in estimate from long to short at 6 cm which they described. We believe this is due to the fact that their

Table 2 Behaviour of second estimate for different lengths of first estimate

Position of first estimate	Second estimate		
	Short	Equal	Long
<6 cm	38	14	23
6.1-10 cm	14	3	8

$\chi^2 = 0.0124$, NS.

subjects were normal volunteers who were trying to memorise the position of an arbitrary line, whereas we used patients who have their own built-in pain to use as a reference point. It appears, therefore, that the golden section phenomenon which they described is an artefact induced by using normal volunteers rather than a real problem in clinical use of visual analogue scales.

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- 1 Dixon J S, Bird H A. Reproducibility along a 10 cm vertical visual analogue scale. *Ann Rheum Dis* 1981; **40**: 87-9.
- 2 Scott J, Huskisson E C. Accuracy of subjective measurements made with or without previous scores: an important source of error in measurements of subjective states. *Ann Rheum Dis* 1979; **38**: 558-9.

SIR, We read the above letter of Dr Dawes and Dr Haslock with interest. Our earlier study¹ simply sought to draw attention to possible variation in reproducibility along the length of a VAS that might occur if we followed recommendations² to allow subjects access to their previous scores. All workers now seem agreed that this variation occurs,³ and our subsequent studies on serial exposure to visual analogue scales also confirm it.⁴

We selected normal volunteers in order to exclude any further variation that might arise as patients attempted to reproduce the modality measured (be it pain, stiffness, or sleep) on a 10 cm line. To have investigated this would have involved inflicting pain or stiffness on our volunteers. Alternatively we could have used patients but felt that their subjective interpretation of pain (or stiffness) would have added too great a source of error.

We suggested in our paper that errors resulting from the 'golden section' phenomenon are certainly in evidence but are a less likely source of error than a variety of other factors that appertain in the clinic. We are therefore pleased that

Table 1 Differences in estimates at different sites on the VAS

Distance (cm) up VAS	Second estimate			Mean difference	Standard deviation
	Short	Equal	Long		
0-1	5	3	6	0.2	0.254
1-2	4	3	5	0.283	0.327
2-3	8	2	4	0.35	0.401
3-4	7	3	4	0.478	0.544
4-5	7	3	3	0.331	0.382
5-6	7	0	1	0.85	0.65
6-7	6	1	2	0.478	0.421
7-8	3	0	4	0.643	0.378
8-9	1	2	2	0.08	0.083
9-10	4	0	0	0.175	0.096

our colleagues in Middlesbrough have reached similar conclusions from their data.

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Uric acid and intelligence

SIR, It was recently claimed that the superior intellectual powers of the higher primates may be to some extent a consequence of high uric acid levels. This is to let you know that we had the opportunity some time ago to investigate the correlations between serum uric acid level and 'intelligence.'¹ We studied 270 children aged 0 to 16 years (including subjects with epilepsy, with behaviour problems, with mental deficiency, and overgifted subjects). The results lend substantial support to the hypothesis that serum uric acid is related to intellectual level in the paediatric age group (mean serum uric acid level in mentally retarded children = 3.98, in 'overgifted' children = 4.77).

We may add that in our study we decided to investigate a number of children in order to exclude the many variables (so often stress in adults, eating habits, etc.) which could play an important role in the uric acid level in the adult population. In our search of the medical world literature we could not find any other investigator who had studied before us the same subject in the paediatric age group.

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Reference

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Streptococci and reactive arthritis

SIR, Reactive arthritis is a term reserved for a sterile polyarthritis following a variety of infections. In patients with the HLA B27 antigen the syndrome commonly includes sacroiliitis and a symmetrical, predominantly lower limb arthritis. It has been described as a consequence of shigella, chlamydia, and yersinia^{1 2} infections. We have recently seen a case of reactive arthritis in an HLA B27 positive individual following a streptococcal throat infection.

A 22-year-old woman presented to her general practitioner in January 1980 with a short history of a sore throat. A clinical diagnosis of tonsillitis was made and the patient given penicillin. Although her sore throat rapidly improved, within 4 weeks she had developed a progressive, symmetrical polyarthritis with painful swelling of her knees and ankles. She complained of stiffness and pain in the low back. There was no history of urethritis, conjunctivitis, or gastrointestinal disturbance.

On examination she was afebrile, with no rashes or heart murmurs. She had evidence of a tender arthropathy, with synovitis and effusions in both knees and ankles and tenderness over both sacroiliac joints. Investigations revealed an erythrocyte sedimentation rate of 100 mm in the first hour. The initial ASO titre was 8330 units/ml. Rheumatoid factor and antinuclear factor were both negative. Radiology of joints showed no abnormality. The patient was HLA B27 positive.

Treatment consisted of anti-inflammatory agents, but improvement was slow. There were a number of exacerbations over a 12-month period, one requiring corticosteroid therapy. Throughout this period sacroiliac pain remained a prominent feature.

The association between the reactive arthritis, sacroiliitis, and streptococcal throat infection may be coincidental. However, the timing, the pattern of the disease, and the lack of other obvious triggering factors suggest that streptococci may need to be considered in the list of infections known to precipitate this condition.

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Allopurinol effect on renal function in gout

SIR, Many of your readers must regret that you no longer publish the discussion of papers which have been read to the Heberden Society. This was brought home to me by