- 4 Simmons A, Barrington S, O'Doherty MJ, Coakley AJ. Dual energy x ray absorptiometry normal reference range use within the UK and the effect of different normal ranges on the assessment of bone density. *Br J Radiol* 1995;68:903-9.
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Different guidelines will yield different estimates of prevalence

EDITOR,—J E Compston and colleagues suggest that in clinical practice patients should be selected for bone densitometry on the basis of clinical or historical risk factors.¹ Having recently assessed the guidelines on the detection of osteoporosis that operated during the first year of operation of the bone densitometry service in the Wirral, we would point out that care is needed in selecting criteria for bone densitometry as different criteria lead to different rates of detection of disease.

We have the only densitometer in Wirral, which has a catchment population of 365 000. Our guidelines stated that the following categories of patients would be eligible for scanning: women who had taken hormone replacement therapy for 18 months, to determine whether the treatment should be continued; women who were unable to take hormone replacement therapy; women who had sustained a trivial fracture (including vertebral fractures); women taking corticosteroids; and private referrals.

Altogether 435 scans were obtained in the first year, of which 307 fell within the guidelines. The table shows the number of scans obtained for various indications and the incidence of osteoporosis detected (on the basis of the World Health Organisation's guidelines.² The highest proportions of women with osteoporosis were found in the groups with osteopenia evident in x ray films (58%) and with trivial fractures (50%) ($P=0.002$, χ^2 test). When patients who were already taking antiosteoporotic treatment (those who had had 18 months of hormone replacement therapy or were taking etidronate) were excluded we found no difference in the proportion with osteoporosis between the group referred according to our guidelines and the other referrals ($P=0.74$ for the lumbar spine, $P=0.44$ for the femoral neck, χ^2 test). When, however, we reanalysed our data using the guidelines suggested by Compston and colleagues (trivial fractures, use of corticosteroids, premature menopause, and osteopenia evident in x ray films) we found a significant difference in the proportion of patients with osteoporosis between the group referred according to their guidelines (75/178 (42%) had osteoporosis of the lumbar spine and 99/178 (56%) of the femoral neck) and the others (77/257 (30%) had osteoporosis of the lumbar spine and 109/257 (43%) of the femoral neck; $P=0.02$ for the lumbar spine, $P=0.02$ for the femoral neck, χ^2 test).

In conclusion, 71% of our referrals adhered to our guidelines, which suggests that the guidelines are reasonably well followed. A balance has to be achieved, however, between setting guidelines to detect disease and setting guidelines that take

into account patients' preferences (for example, scanning of women who were already taking hormone replacement therapy made up 15% of our workload) but have a lower rate of detection.

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1 Compston JE, Cooper C, Kanis JA. Bone densitometry in clinical practice. *BMJ* 1995;310:1507-10. (10 June.)

2 World Health Organisation. Assessment of fracture risk and its application to screening for postmenopausal osteoporosis. *WHO Tech Rep Series* 1994;No 843.

Authors' reply

EDITOR,—We agree with Andrew Simmons and colleagues about the need to standardise reference values for bone densitometry; differences between manufacturers' reference data have been reported previously,¹ as have differences in reference data from different centres in Britain.² The number and selection of subjects on whom these data are based and geographic differences in bone density will affect the absolute values measured, the pattern of changes related to age, and the variance. These factors in turn contribute to variations in the classification of patients, whether this is based on T scores, Z scores, or absolute values. The use of Z scores to diagnose osteoporosis is illogical since the prevalence of osteoporosis, thus defined, would not increase with age, while the use of an absolute value as a diagnostic criterion is problematic because differences between measurement systems in calibration, detection of the edge of the bone, and methodological approach produce different absolute values for a given bone density.³ Until there is better standardisation of reference data, inconsistencies in classification will persist, regardless of which diagnostic criteria are used; however, T scores provide the most appropriate means of defining osteoporosis, and problems associated with reference data, while requiring attention, should not be allowed to detract from the clinical value of bone densitometry as currently practised.

In response to S S Yeap and colleagues' letter, it is self evident that different guidelines for bone densitometry will result in varying rates of detection of osteoporosis. Assessment of guidelines should not, however, be based solely on the percentage of patients found to have osteoporosis since high rates of detection may reflect inappropriate use of bone densitometry in patients in whom a diagnosis has already been made; conversely, the exclusion of osteoporosis in patients with risk factors is a valuable component

of bone densitometry services since it provides reassurance and avoids unnecessary treatment. Finally, guidelines that take into account patients' preferences are unlikely to be viewed favourably by health authorities or commissions that are approached to provide funding for bone densitometry.

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1 Laskey MA, Crisp AJ, Cole TJ, Compston JE. Comparison of the effect of different reference data on Lunar DPX and Hologic QDR-1000 dual-energy X-ray absorptiometers. *Br J Radiol* 1992;65:1124-9.

2 Murrills AJ, Taylor PA, Cotton AM, Petley GW, Cooper C, Wilkin TJ. Bone mineral density in Southampton women. In: Ring EFJ, Elvins DM, Bhalla AK, eds. *Current research in osteoporosis and bone mineral measurement III*. London: British Institute of Radiology, 1994:61.

3 Laskey MA, Flaxman ME, Barber RW, Trafford S, Hayball MP, Crisp AJ, et al. Comparative performance in vitro and in vivo of Lunar DPX and Hologic QDR-1000 dual energy X-ray absorptiometers. *Br J Radiol* 1991;64:1023-9.

Comparing hospital and chiropractic treatment for back pain

Trial did not compare like with like

EDITOR,—In the move towards evidence based medicine, randomised trials should be welcomed. The study by T W Meade and colleagues, however, is flawed in both its methodology and its analysis.^{1,2}

Essentially, the study does not compare like with like. There is no information on outcomes of treatment for different grades of physiotherapists, for the physiotherapists' differing levels of training in manipulation, or for Cyriax versus Maitland manipulation when compared with the outcomes of chiropractic. Each treatment group had a different number of treatments and probably received treatment for different lengths of time. When the number of treatments was similar (at six weeks) there was no significant difference in the mean changes in the Oswestry scores between the two therapies. While significance was reached at six months, when the number of extra chiropractic treatments "was not yet extensive," there was no significant difference at one year.

We suggest that the key messages from this study should advocate more extensive investment in postgraduate training in physiotherapy and in physiotherapists to achieve treatment that is more equitable with that in the private sector. Furthermore, randomised controlled trials in physiotherapy, chiropractic, and other complementary therapies are needed so that NHS purchasers can choose the most beneficial and cost effective treatments for their patients.

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1 Meade TW, Dyer S, Browne W, Frank AO. Randomised comparison of chiropractic and hospital outpatient management for low back pain: results from extended follow up. *BMJ* 1995;311:349-51. (8 August.)

Incidence of osteoporosis detected for each indication for bone densitometry

	No of women	No (%) with osteoporosis of:	
		Lumbar spine	Femoral neck
Taken hormone replacement therapy for 18 months	67	18 (27)	21 (31)
Unable to take hormone replacement therapy	61	18 (30)	27 (44)
Trivial fracture (including vertebral fracture)	91	45 (50)	55 (60)
Use of steroids	50	17 (34)	27 (54)
Private referral	38	8 (21)	13 (34)
Premature menopause	18	2 (11)	5 (28)
Taking etidronate	16	7 (44)	13 (81)
Osteopenia evident in x ray film	19	11 (58)	12 (63)
Family history of osteoporosis	27	8 (30)	13 (48)
Other	48	18 (38)	22 (46)
Total	435	152 (35)	208 (48)