hypertension may be compared. It is still common to use a too high a dose, making the new treatment look superior. We agree that some new drugs do not have any adverse metabolic effects, even in high doses. It should be remembered, however, that there are no clinical data showing that such new drugs reduce the mortality and morbidity of hypertension. Thiazides in doses that we consider high affect the risk of stroke in hypertensive patients—we now need to know whether lower doses of thiazides also prevent myocardial infarction and decrease related mortality.

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Splints

SIR,—In her article on splints Ms Patricia M Riley states that orthotists are usually apprentice trained by commercial companies. This statement is not correct: the professional training and education of orthotists and prosthetists in Britain are carried out by two establishments, the National Centre for Training and Education in Prosthetics and Orthotics, Strathclyde University, Glasgow (BSc honours), and the City of Westminster College, London (Higher National Diploma in orthotics and prosthetics).

The course provided in Strathclyde University is of four years' duration. The first three years of the course are devoted to academic study, interlinked with practical training in the fitting and fabrication of prosthetic and orthotic devices, including arm orthoses. The final year is devoted to clinical practice within the hospital environment under appropriate supervision.

The course provided by the City of Westminster College is of three years' duration. After obtaining the Higher National Diploma in orthotics and prosthetics the student is required to complete a further intern year and, on completion, is awarded a diploma in orthotics or prosthetics, depending on the chosen discipline.

Also mentioned in the article is the subject of suitable materials for wrist-hand orthoses. The orthotist should have the facilities to use both high and low temperature thermoplastic materials. The type of material used will depend on a number of factors including strength requirements, whether serial adjustment is required, and durability. I would agree that low temperature thermoplastics are suitable materials for many wrist-hand

orthoses, but in many instances it is essential to use high temperature materials. Many occupational therapy departments do not have the facilities, or the expert knowledge, to provide orthoses made with high temperature thermoplastics; thus the orthotist is usually called on to provide these orthoses.

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Enalapril and metoprolol in diabetic nephropathy

SIR,—Dr S Björck and colleagues report significantly lower rates of proteinuria in patients with diabetic nephropathy treated with enalapril compared with those treated with metoprolol.¹ The study, however, looked only at effects in the short term, and no randomised controlled long term studies of such adverse effects of angiotensin converting enzyme inhibitors have been reported.

We performed a meta-analysis of studies of long term antihypertensive treatment in patients with overt diabetic nephropathy. Six studies met our criteria for analysis: specific antihypertensive treatment for more than 12 months, sequential measurements of glomerular filtration rate, and no duplication of patients in repeated publications.²⁻⁷ Of 38 patients given angiotensin converting enzyme inhibitors, some also received diuretics and vasodilators. We compared these data with those on 39 patients who received cardioselective β blockers, diuretics, and vasodilators but no angiotensin converting enzyme inhibitors. Age and duration of diabetes did not differ between the groups.

Blood pressure was lowered to $146 \pm 16/90 \pm 7$ mm Hg in the group given angiotensin converting enzyme inhibitors compared with $138 \pm 15/85 \pm 7$ mm Hg in the group given other antihypertensive treatment ($p < 0.01$). Albuminuria and proteinuria decreased less in the group given angiotensin converting enzyme inhibitors to a median of 67% (range 5 to 363%) of the initial values compared with a median of 42% (range 2 to 129%) in the group given other antihypertensive treatment ($p < 0.04$).²⁻⁷

The fall in glomerular filtration rate was not significantly different between the groups—it fell by a median of $4.4 \text{ ml/min/1.73 m}^2$ (range 0 to 15) in the group given angiotensin converting enzyme inhibitors compared with $4.4 \text{ ml/min/1.73 m}^2$ (range -7 to 29) in the group given no angiotensin converting enzyme inhibitors.

The results of this meta-analysis confirm the conclusions of Dr Björck and colleagues that the decrease in proteinuria observed in patients taking enalapril depends primarily on the degree of blood pressure reduction. In the long run angiotensin converting enzyme inhibitors do not seem to have a specific adverse or beneficial effect on diabetic nephropathy. The quality of care for patients with hypertension and diabetic nephropathy depends primarily on early diagnosis and effective lowering and maintenance of blood pressure rather than on introducing new pharmaceutical principles.⁸

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Autonomic neuropathy after cisplatin based chemotherapy

SIR,—Dr Steen Werner Hansen recently showed some evidence of autonomic neuropathy in 10 out of 28 patients who had received six courses of cisplatin, vinblastine, and bleomycin for metastatic germ cell cancer.¹ No patient had postural hypotension. We observed postural hypotension in five (7%) out of 71 patients treated with cisplatin based combination chemotherapy for metastatic germ cell cancer.

Thirty two patients had cisplatin, etoposide, and bleomycin; 10 had cisplatin and etoposide only; and the remaining 29 had other cytotoxic drugs, including either vinblastine or vincristine, in addition to cisplatin, etoposide, and bleomycin. One heavily treated patient had severe postural hypotension, causing collapse, and required treatment with mineralocorticoids. In addition to postural hypotension, another patient had intermittent palpitations and dyspnoea on exertion. He was mildly anaemic (haemoglobin 109 g/l), and an electrocardiogram showed type 1, second degree atrioventricular block with a prolonged PR interval and premature beats. Two weeks later a 24 hour electrocardiogram was normal. After a blood transfusion his symptoms completely resolved. Another patient who complained of dyspnoea and dizziness on postural change did not show a postural change in blood pressure recordings, and subsequent investigations led to a diagnosis of pulmonary infarction.²

Our cases tend to support Dr Hansen's observation that some patients with metastatic germ cell cancer have autonomic neuropathy, presumably related to cytotoxic chemotherapy based on cisplatin. The origins of autonomic neuropathy in patients with cancer, however, are probably multifactorial, and cytotoxic drugs may be only one factor.³ We are less convinced of Dr Hansen's view that sudden deaths in these patients have been wrongly ascribed to vascular toxicity and may in fact have been due to autonomic dysfunction. In the paper quoted by Hansen necropsies showed vital organ infarction and evidence of severe vascular disease in two out of five patients, and in two others there was strong evidence of severe vascular disease before death.⁴ Detailed clinical investigations showing vascular toxicity during life have been reported,^{5,6} and it has been suggested that vital organ vascular toxicity might be enhanced by cisplatin induced hypomagnesaemia provoking coronary artery spasm.⁶

It is thus important to differentiate the dominant toxicity, vascular or neuropathic, in individual patients, recognising that they may coexist. Management might differ, depending on this differentiation.

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Read clinical classification

SIR,—Dr J Chisholm's welcome for the purchase by the Department of Health of the Read clinical classification¹ provides a refreshing contrast to the dogmatic cynicism of a recent editorial in the *Lancet*.² The department's bold strategic move places this country ahead of the rest of the world in computing clinical data.

The government's intention is clear—to disseminate computing techniques as widely as possible throughout health care. Momentous matters hang upon this decision, not least questions of cost. The rubric "clinical classification" fails, however, to address computer analysis of the complete medical record including symptoms.³

Computers have a vital role to play in clinical medicine but the Read system has three fundamentals which augur ill. Firstly, neither the Read classification nor the ninth revision of the International Classification of Diseases (ICD 9) on which it relies is based on the frequency with which clinical events actually occur in medical practice. Thus back pain and cough are a million times more prevalent than, say, cholera and should therefore be correspondingly easier to enter.

Secondly, neither the Read classification nor ICD 9 was initially designed for use in front of patients, which is where most clinicians spend their working lives. Again, chest pain should be 20 times easier to record than myocardial infarction because it occurs more often among the living, and not at all among the dead.⁴

Both these factors impede the use of such codes in a clinical setting. Busy clinicians rightly begrudge computer systems that are too slow or cumbersome to use—doctors will tend to default, thereby threatening the validity of the data recorded.

Finally, the Read classification is a single faceted or uniaxial code, as the working party noted.⁵ This makes analysing the data difficult. For example, if chest pain has only a single entry, it is impossible to refer to the terms pain and chest separately. This poses acute, even insuperable, difficulties in retrieval. Retrieval has always been the computer's Achilles' heel, rendering real time retrieval of clinical data especially challenging.

It is technically possible to use a five faceted code with 30 starting points and six levels of detail (based on the frequency with which patients presented symptoms during a busy decade in general practice) to include a full range of clinical items, and to enter the entire medical record faster than writing longhand. This can be done without typing, indeed without using a keyboard—only a "mouse." Twenty four years' experience of medical computing, however, leaves me with no illusions as to the reception such an extravagant statement will probably evoke.

Instead, let me try another, tighter prediction. The coding of clinical data is vital for the healthy practice of medicine. Within the next decade, therefore, all clinical data will be recorded by a computer code which takes account of the factors I have mentioned. The time scale for this will be

lengthened considerably if medical cynicism continues unabated—and could be sharply forestalled if the truly astonishing benefits of clinical computing became known more widely.

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SIR,—We support strongly the need for standardised coding systems for clinical data.¹ There are dangers, however, in viewing the Read classification system as a panacea. We suspect that the system will not prove suitable for coding clinical data in all circumstances despite its seemingly limitless potential for expansion. This caution is prompted partly by the system's design as a tool for retrospective analysis and partly by the arbitrary nature of its alphanumeric coding scheme. Both points are particularly important when considering clinical data handled by modern laboratory information management systems.

In our pathology laboratory we deal mainly with clinical data before diagnosis. Our users provide us with data on clinical symptoms, signs, and differential diagnosis, which are extensively used in choosing tests and interpreting reported results. By coding such data and by using standard laboratory information systems the most appropriate tests may be chosen and reports of high quality may be delivered to clinicians.

We developed and now use routinely such systems with a mnemonic coding scheme for clinical details (R G Jones *et al.* *Proceedings of seventh international conference on computing in clinical laboratories*, Lugano, Switzerland, 1989). We considered the Read system of coding and rejected it as unsuitable for our purposes. Firstly, the coding was too precise and was unable to cope adequately with the uncertainties inherent in some diagnostic questions. This is not surprising as the classification was designed initially for retrospective coding and analysis.

Secondly, the data we receive are variable and sometimes idiosyncratic. Because we try to return clinical details to the user on the report form, both to put results in context and to encourage appropriate requesting, we wanted to avoid the normalisation of data that occurs with systems such as the Read classification.

Thirdly, our workload is such that coding with alphanumeric codes, even with the use of aids, would be too inefficient. Our clerks must maintain an input rate of 75-100 entries per hour per person, each entry comprising 10 fields with full demographic details of patients, dates and times of sample collection and receipt, as well as clinical data. Our mnemonic uses common medical abbreviations and four letter codes derived from the data used in the request and allows rapid coding of 95% of the details provided. Our non-medical clerical staff routinely code 70% of the requests received without recourse to search aids, thereby sustaining the necessary rates of data input. We have found in practice that codes can be used effectively to control the flow of work through the laboratory, increase efficiency, reduce unnecessary testing, and enhance the quality of diagnostic information.

We suggest that before adopting a clinical data coding system, particularly one so large and complex as the Read classification, the exact purpose of the planned task and the implications for staff should be fully considered. We believe that other coding systems will be adopted eventually as international standards but each will be designed in relation to the functions it is intended to support.

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The cyclotron saga

SIR,—Again a news report shows bias against neutron therapy¹—or is the bias really against a £6m grant from the Treasury which certainly won't come into the NHS any other way?

Ms Jane Smith manages to write several lines on the Medical Research Council's decision to stop trials at Clatterbridge of neutron therapy in pelvic cancer without mentioning a trial on salivary gland tumours which was closed because the results for neutron therapy were so good that "it became very difficult to continue accrual to a randomised study containing photon treatment."² Ms Smith repeats the differences between results in the Hammer-smith and Edinburgh trials in the 1970s and fails to note the considerable differences in dose and technique of neutron therapy and the stage of tumour treated, which make comparisons valueless.³

Apparently unaware of the authoritative letter from Dr William Powers and Dr Richard Maughan published in the *BMJ*, she repeats again an untrue statement about neutron funding in the United States.⁴ Third party reimbursement by medical insurance companies of charges paid by patients is now routine in the United States. Ms Smith ignores this evidence, which was in a letter from the United States National Institutes of Health sent to her when she was preparing her article.

It would be difficult to conclude from the news report that patients are routinely treated with neutrons in Belgium, that a new high energy cyclotron is just undergoing final tests before being used to treat patients in Nice, and that there are cyclotrons working or being installed in Germany, India, Japan, South Africa, South Korea, and the United States.

Ms Smith introduces an unfounded connection between the release of the grant and the raising of funds. It is exasperating that the happy combination of public and private funding, NHS experience, and commercial management that will make neutron and proton treatment available in London in a major university hospital is not welcomed by those who readily accept that, for some patients with cancer, this is the treatment of choice. Just because your cancer is "rare" does not mean that you should not receive the best treatment.

Equally, just because neutron therapy is apparently unpopular in some circles that does not mean that it should not have a balanced news report. Factual omissions do not strengthen a case, nor do tasteless captions to accompanying photographs. Readers of the *BMJ* deserve better.

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