not been difficult to obtain since the 1940s, but doctors have never got round to telling nurses that measurement of the pulse deficit should be abandoned. If this were to happen a considerable amount of nursing time could be saved.

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Digoxin comes from *Digitalis lanata*

EDITOR,—Gregory Y H Lip and colleagues say that the purple foxglove, *Digitalis purpurea*, contains digoxin.[1] This is wrong. Digoxin is obtained from the leaf of the woolly or Balkan foxglove, *D lanata*,[2] from which it was first isolated by Dr Sydney Smith at Burroughs Wellcome in Britain in 1930. It is still extracted from the plant because, although it can be made synthetically, this is a difficult and expensive process. Soon after the war the Dutch realised that plants would still be essential for the production of important drugs, and with funds from the Marshall Plan they cultivated the foxglove on a large scale. By selective breeding of *D lanata* they improved the yield of digoxin, and this drug is currently chiefly obtained from plants grown on a cooperative farm at Elburg in the Netherlands. *D purpurea* yields digitoxin,[3] which is now seldom used in Britain.

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Authors' reply

EDITOR,—In response to Tom Snow, our purpose in using as an illustration the ward observation chart showing the apex-radial pulse deficit in a patient with atrial fibrillation was not to condone the routine recording of this. Indeed, we did not even discuss it as part of routine clinical management. However, the pulse deficit is abolished after a return to sinus rhythm, and this may be useful in the clinical examination of patients with paroxysmal atrial fibrillation.

Our illustration shows that oral digoxin is relatively slow in achieving a satisfactory response of the ventricular rate in fast atrial fibrillation; this is a particular problem during exercise, fever, and other states in which catecholamine concentrations are high. In a study of 115 patients with fast atrial fibrillation the median time to achieve a ventricular rate of < 100 beats/min was 11·6 hours; at 24 hours the rate had been controlled in only 70% of patients.[1] Although intravenous digoxin begins to work sooner (< 30 minutes) than oral digoxin (30-60 minutes or more), it does not work instantaneously. Oral administration of digitalis, with a loading dose of 1 mg, produces peak blood concentrations of > 1 μg/l within one to five hours and a maximum effect only after four to six hours; by contrast, an intravenous loading dose of 0·75-1 mg digoxin gives labile initial plasma digoxin concentrations (as high as 95 μg/l, which may be potentially more dangerous).[2] Thus loading still takes several hours to achieve its maximum effect in slowing the rate, and caution is necessary in elderly patients and those with renal impairment.

Although digoxin is commonly used in Britain, some authorities (especially in North America) have described it as a drug "whose time has gone," as β blockers and calcium antagonists (verapamil, diltiazem) are more efficient alternatives for controlling the rate.[3]

William Withering described the use of leaves from the purple foxglove (*Digitalis purpurea*) in "treatment of the dropsy"; the leaves were subsequently found to contain various compounds (initially described as "digitalin"), one of the most potent being digitoxin.[4] Further work on a related plant, *D lanata*, yielded similar glycosides, including digoxin and the natural precursors of digitoxin and digoxin, which were initially referred to as "digitalis glycosides."[4] As A Hollman states, most commercial digoxin is now obtained from *D lanata*.

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Techniques of vasovasostomy should be improved for men seeking fertility

EDITOR,—Y Khalifa and J G Grudzinskas highlight the recent advances in achieving fertility in azoospermic men with congenital or acquired obstructive problems by means of direct aspiration of sperm from the epididymis or testis and subsequent injection of sperm into the cytoplasm of the ovum.[1] Successful fertilisation can be achieved by these methods even if only just a few sperm are available.

A considerable proportion of men seeking fertility are those who wish to have a vasectomy reversed and those in whom attempted reversal has failed. Most vasovasostomies in Britain entail the insertion of several approximating whole thickness stitches, sometimes over a temporary indwelling splint, without the aid of any magnification; resulting fertility rates are below 50%.[2] Most failures are due to obstruction at the anastomotic site.[3] Microsurgical reoperation can restore sperm in the ejaculate in most cases, but the best results are obtained with meticulous microscopic surgery as the primary operation, when patency of virtually 100% can be achieved, with fertility rates of up to about 70%.[4,5]

Sperm aspiration and intracytoplasmic sperm injection involve specialised, labour intensive, and expensive techniques, which are unlikely to become available in more than a few selected specialised centres. Moreover, further conception, if desired, requires use of these techniques again, whereas after successful vasovasostomy conception is possible by natural means. Before widely recommending methods of assisted conception for men in whom an operation to reverse a vasectomy has failed, let us improve vasovasostomy by using microsurgical techniques such as those used in the United States, where anything less is considered to be inadequate.

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Prescribing of quinine and drugs that induce cramp

Study did not consider several factors

EDITOR,—Margaret A Mackie and John Davidson imply that general practitioners (particularly those in "high prescribing practices") prescribe quinine too frequently and before considering iatrogenic causes of the symptoms for which it is being used.[1] They also suggest that quinine is of equivocal efficacy.

The authors attempt to draw conclusions about prescribing costs from the cost or number of prescriptions issued per 100 patients. They make no reference to the age-sex profiles of the practices, which obviously influence prescribing and, as we are told anecdotally that "prescriptions for quinine were predominantly issued to women patients over 65," could be an explanation for the findings. In addition, the assumption that practices that prescribe more than 90 items per 100 patients are high volume prescribers fails to take into account the number of tablets issued per prescription. General practitioners who review their patients more regularly and issue fewer drugs per visit are erroneously labelled high volume prescribers.

The authors conclude that "a review of the need for and dosage of current drugs may be all that is required to alleviate the problem." They fail, however, to inform us of the proportion of patients in whom this course of action was considered or tried and in whom it was decided that agents that induce cramp could not safely be stopped (which the authors concede would be an indication for prescribing quinine).

Finally, the authors make no assessment of patients' symptomatic relief or the prevalence of symptoms in the practices that they imply are prescribing inappropriately compared with low prescribing practices. Possibly such practices have a particular interest in their elderly population and therefore detect more problems. In many areas of general practice the simplest way to keep prescribing costs down is to fail to recognise or detect a problem.

While I fully endorse efforts to rationalise prescribing, surely the above factors should have been considered. General practitioners often receive advice about prescribing that attempts to draw conclusions from poor studies. I am amazed that this article was published in its current form.

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1 Mackie MA, Davidson J. Prescribing of quinine and cramp inducing drugs in general practice. *BMJ* 1995;311:1541. (9 December.)

GPs should not be deterred from prescribing quinine

EDITOR,—In their paper on the prescribing of quinine and drugs that induce cramp the authors seem to be trying to convey three messages, all in my opinion fallacious.[1] One is that quinine is of doubtful efficacy in nocturnal cramps. Since