

300 ml (300 mg) per bottle. This may be a week's supply for a drug dependent adult, but 20-30 ml can be lethal to a small child. Methadone syrup tastes pleasant enough for children to consume 150-200 ml without complaint.

Parents often delay bringing to hospital children who have taken methadone. Drug dependent adults who can tolerate large doses of the drug may assume that a child will "sleep it off," and parents may be deterred from taking a child to hospital because they know that their competence to look after the child will be questioned.

We are not trying to imply that methadone users should not have the care of their small children, but some steps must be taken to protect these children. We strongly suggest that it should be a legal requirement that all methadone be prescribed in child resistant plastic bottles. Further, methadone should be bitter to taste. Finally, very serious consideration should be given to limiting the quantity prescribed at any one time to methadone users who are responsible for small children.

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Orthopaedic surgeons and thromboprophylaxis

SIR,—I congratulate Mr M D Laverick and colleagues on their article on methods currently being used to prevent thromboembolism in orthopaedics.¹ There is, however, one more factor, which is not mentioned—that is, the type of anaesthesia.

In 1978, as part of a study on spinal anaesthesia and general anaesthesia,² I estimated the incidence of deep vein thrombosis after hip replacement by using the fibrinogen uptake test and phlebography.³ Altogether 120 patients were studied, of whom 56 received a spinal anaesthetic and 64 a general anaesthetic. Operative blood losses were measured. No patient had thromboprophylaxis. Spinal anaesthesia was associated with both a lower frequency of thrombosis (19/56 patients *v* 36/64 patients, $p < 0.001$) and a smaller loss of blood (464 ml *v* 851 ml, $p < 0.001$). The mechanism is not clear, but conceivably a low operative blood loss in some way reduces the thrombogenic challenge.

Since I became a consultant orthopaedic surgeon in 1979 my anaesthetist colleagues have used regional blockade increasingly. Now almost all patients having major operations undergo spinal or epidural anaesthesia. These techniques preclude the use of agents affecting blood clotting, but hydroxychloroquine and elastic (TED) stockings can also be used safely. The result is effective thromboprophylaxis for major orthopaedic cases.

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- 1 Laverick MD, Croal SA, Mollan RAB. Orthopaedic surgeons and thromboprophylaxis. *BMJ* 1991;303:549-50. (7 September.)
- 2 Thorburn J, Loudon JR, Vallance R. Spinal and general anaesthesia in total hip replacement: frequency of deep vein thrombosis. *Br J Anaesth* 1980;52:1117-21.
- 3 Loudon JR, McGarrity G, Vallance R, Bayliss AC, Graham J. The fibrinogen uptake test after hip surgery. *Br J Surg* 1978;65:616-8.

SIR,—A recent issue of the journal rightly focused attention on thromboprophylaxis after hip surgery in general and hip replacement in particular. The fact that 90% of the orthopaedic surgeons who responded to a questionnaire do use some form of prophylaxis points to their serious attitude to the

problem.¹ The common concern is the safety and the effectiveness of any method. Dr P F Leyvraz and colleagues point out the complexities of any trial: 63% of the patients had to be excluded.² This group presumably would not have received the benefit of the prophylaxis. Stopping the drugs on day 9, 10, or 11 is illogical as 70% of fatal pulmonary emboli occur between the seventh and 14th postoperative days.³ To this must be added the significant seasonal variations in the incidence of fatal pulmonary embolism after hip replacement surgery,⁴ the gradual decline in this incidence since 1974,³ and the apparently lower incidence in patients with more extensive surgery and prolonged bed rest.³

To suggest that "What is needed is the most effective drug with the simplest method of administration and control and the smallest risk of adverse effects"⁵ is to state the obvious. To suggest "Prophylaxis now or negligence claims later"⁵ is to use the threat of litigation to institute measures whose effectiveness the authors themselves are not sure of—all this presumably on the assumption that to do something is to do good while to do nothing implies negligence.³ It is a pity that the authoritative editor's choice seems to fall into the same trap, asking "What could be clearer than that?"

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- 1 Laverick MD, Croal SA, Mollan RAB. Orthopaedic surgeons and thromboprophylaxis. *BMJ* 1991;303:549-50. (7 September.)
- 2 Leyvraz PF, Bachman F, Hoek J, Büller HR, Postel M, Samama M, et al. Prevention of deep vein thrombosis after hip replacement: randomised comparison between unfractionated heparin and low molecular weight heparin. *BMJ* 1991;303:543-8. (7 September.)
- 3 Wroblewski BM. *Revision surgery in total hip arthroplasty*. New York: Springer Verlag, 1990:221-4.
- 4 Wroblewski BM, Siney P, White R. Seasonal variation in fatal pulmonary embolism after hip arthroplasty. *Lancet* 1990; 335:56.
- 5 Parker-Williams J, Vickers R. Major orthopaedic surgery on the leg and thromboembolism. *BMJ* 1991;303:531-2. (7 September.)

SIR,—Mr M D Laverick and colleagues suggest that although low dose subcutaneous heparin (that is, 5000 IU two or three times daily) may be effective in reducing the incidence of calf thrombosis, it may not be effective against proximal segment deep vein thrombosis and pulmonary embolism.¹

A systematic overview of all randomised trials of prophylactic perioperative administration of low dose subcutaneous heparin has shown highly significant reductions of about two thirds in the incidence of deep vein thrombosis detected by radiolabelled fibrinogen in patients undergoing general surgery ($2p < 0.0001$), urological surgery ($2p < 0.001$), elective orthopaedic surgery ($2p < 0.001$), and traumatic orthopaedic surgery ($2p < 0.0001$).² The fibrinogen uptake test has some limitations in detecting thrombi after orthopaedic surgery, but this does not invalidate these findings because these limitations would apply at least as much to patients allocated to receive heparin as to controls and would therefore merely make it more difficult to detect any real benefits. Furthermore, when attention was restricted to proximal thrombi recorded in the orthopaedic trials there was a 56 (± 12)% ($2p < 0.0001$) reduction in proximal deep vein thrombosis, the crude total numbers of patients affected being 58 of the 418 allocated heparin and 107 of the 411 controls (or 32 versus 63 if only those proximal thrombi with confirmatory phlebograms were considered; $2p < 0.001$).

Pulmonary emboli occur far less commonly than deep vein thrombosis, so that an overview of all the randomised trials is particularly useful in determining whether subcutaneous heparin does reduce the risk and in providing a more reliable estimate of the size of any reduction in risk.³ Overall this

indicates a reduction in the odds of pulmonary embolism of 47 (± 9)% ($2p < 0.00001$). The most important hazard, of course, is fatal pulmonary embolism. Overall in all trials only 74 deaths were attributed to this cause, but the effects of treatment were still highly significant (19 deaths among patients allocated to heparin *v* 55 among controls; $2p < 0.0001$), and the reduction was as large in the orthopaedic surgery trials (five deaths *v* 15; $2p < 0.02$) as in the other surgery trials (14 *v* 40 deaths).

If, as is suggested by these data on deep vein thrombosis and fatal pulmonary embolism, the proportional risk is fairly similar in these different situations then the absolute benefits of low dose subcutaneous heparin may be greatest in patients at highest risk of pulmonary embolism—for example, those undergoing orthopaedic surgery. This does not imply, of course, that some other method of prophylaxis could not be used in addition to or instead of perioperative subcutaneous heparin, but it does imply that some form of prophylactic anticoagulation should be considered routinely, at least in patients at appreciable risk of thromboembolic events.

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- 1 Laverick MD, Croal SA, Mollan RAB. Orthopaedic surgeons and thromboprophylaxis. *BMJ* 1991;303:549-50. (7 September.)
- 2 Collins R, Scrimgeour A, Yusuf S, Peto R. Reduction in fatal pulmonary embolism and venous thrombosis by perioperative administration of subcutaneous heparin. *N Engl J Med* 1988;318:1162-73.
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SIR,—In these days when orthopaedic surgeons are under increasing pressure from pharmaceutical companies and from litigation I was saddened to read Dr J Parker-Williams and Mr Roger Vickers's editorial on prophylaxis against thromboembolism.¹ It was misleading in two respects.

Firstly, major operative procedures on the lower limbs are powerfully thrombogenic, and it is not sufficient to rely on data from studies of general surgery. The main purpose of prophylaxis is to reduce the incidence of fatal pulmonary embolism, and this has not been shown in any of the orthopaedic studies referred to in the editorial. A meta-analysis of the combined results of 13 randomised trials in total hip replacement showed a beneficial effect of heparin in the early postoperative period,² but this may represent only a delay in the presentation of the condition after prophylaxis is stopped. No benefit could be shown after hip fracture. Later symptoms of venous insufficiency have not been found to correlate with postoperative thrombosis after total hip or knee arthroplasty.³

Secondly, the subtitle of the editorial refers to the subject of negligence, though this subject is not mentioned in the article itself. Establishing negligence after a fatal embolism would pose difficulties, not only in view of the problems in showing the efficacy of prophylaxis but also because no present method abolishes this complication. There is no "inescapable" case for using the present methods of prophylaxis in orthopaedic surgery, and it is misleading for the authors to state that there is.

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- 1 Parker-Williams J, Vickers R. Major orthopaedic surgery on the leg and thromboembolism. *BMJ* 1991;303:531-2. (7 September.)
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- 3 Francis CW, Ricotta JJ, Evarts CM, Marder VJ. Long-term clinical observations and venous functional abnormalities after asymptomatic venous thrombosis following total hip or knee arthroplasty. *Clin Orthop* 1988;232:271-8.