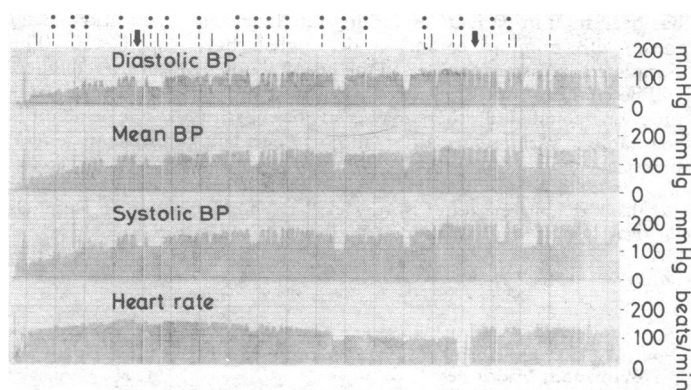


hourly, and diazepam, 3 mg hourly, both intravenously. An indwelling radial artery line was inserted and connected to a Hewlett Packard trend recorder (Model 7825 A), which allowed for the continuous monitoring of heart rate, and diastolic, mean, and systolic blood pressure. Such recording permitted the recognition of three forms of sympathetic overactivity in this patient: (1) spontaneous—that is, apparently unprovoked by specific stimuli, such as handling or hypercarbia; (2) spasm-associated, occurring in association with a tetanic spasm; (3) iatrogenic, provoked by handling the patient, physiotherapy, or tracheobronchial toilet.

On the 6th and 7th hospital days (figure) 11 spasms occurred over 21 hours, but all were mild and occurred at times when sedatives were due. Nevertheless, sympathetic overactivity was almost continuous, and at one point (seen on the right-hand side of the recording) the patient had a systolic blood pressure of about 300 mm Hg and a diastolic blood pressure of 200–220 mm Hg. This was treated with 10 mg propranolol given by nasogastric tube. By following the recording from right to left, it may be seen that a progressive but mild reduction in the blood pressure resulted, with a shorter-lived reduction in the heart rate. A further 10 mg propranolol was given 12 hours later, as blood-pressure control was considered inadequate—after which there was a profound fall in blood pressure with compensatory tachycardia. The patient developed gross pulmonary oedema three hours after the second dose of propranolol and had a cardiac arrest. Resuscitation failed.



A trend tracing over 21 hours showing 11 spasms (—) with almost continuous sympathetic overactivity. Physiotherapy (..) and tracheal suction (---) are also shown. Propranolol, 10 mg orally, was given initially at 1500 (↓) and then again 12 hours later (↓). The decline in blood pressure is clearly seen after the second dose. The terminal increase in blood pressure was related to resuscitative procedures.

## Comment

The present case illustrates the potential hazards of using beta-blockers in patients with tetanus. It is well known that life-threatening complications such as acute congestive cardiac failure and pulmonary oedema may occur with propranolol.<sup>2</sup> Such reactions are not dose-related and occur most frequently after intravenous administration, but may occur with short-term oral treatment.<sup>3</sup> It would appear that certain patients with underlying heart disease are in part dependent on adrenergic stimulation for compensated cardiac function and cannot tolerate even a small decrease in sympathetic drive. There is no evidence that our patient had underlying cardiac disease. Keilty *et al*<sup>4</sup> have shown a rise in the circulating concentrations of adrenaline and noradrenaline in patients with tetanus, and suggested that this may cause the sympathetic crises seen in this disorder. Moreover, a 160–250% increase in cardiac output has been shown in patients with tetanus, while it has also been postulated that such patients may have a “toxic myocarditis.”<sup>5</sup> Nevertheless, the evidence for the last is not convincing. Whether in some patients with tetanus the myocardium becomes dependent on such drive must remain conjectural, but if this were so then treatment with beta-blockers might be potentially dangerous.

In other patients our clinical experience has been that sympathetic overactivity can be damped down by increasing sedation. The decision when to start beta-blockade is difficult and no guidelines exist. Propranolol would appear to be the best drug to use for this clinical problem, but it must be given with extreme caution, preferably by recurrent small-dose intravenous boluses.

We are indebted to Dr P J Beukes, Superintendent of Baragwanath Hospital, for permission to publish these data, and Dr S Miller, of Coronation Hospital, who referred the patient to us.

<sup>1</sup> Prys-Roberts, C, *et al*, *Lancet*, 1969, **1**, 542.

<sup>2</sup> Deglin, S M, Deglin, J M, and Chung, E K, *Drugs*, 1977, **14**, 29.

<sup>3</sup> Gotsman, M S, *South African Medical Journal*, 1970, **44**, 1097.

<sup>4</sup> Keilty, S R, *et al*, *Lancet*, 1968, **2**, 195.

<sup>5</sup> Alhady, S M A, *et al*, *British Medical Journal*, 1960, **1**, 540.

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## Copper intrauterine devices and the small intestine

Copper 7 and Copper T intrauterine contraceptive devices (IUCDs) have gained wide acceptance despite the disadvantage that their effectiveness declines rapidly after two years, necessitating frequent reinsertions. Less attention has been given to a more serious defect—namely, their tendency to enter the peritoneal cavity and once there to penetrate viscera and to provoke tissue reactions.

## Case reports

**Case 1**—This patient's general practitioner fitted a Copper 7 six weeks after her second delivery. Eighteen months later she conceived and after an uneventful pregnancy she had a normal delivery with no sign of the IUCD. X-ray examination showed the device in the left iliac fossa and Eugynon 30 (norgestrel and ethinylloestradiol) was given until the infant was eight months old and could be left with a relative. One month before admission for laparotomy, the Eugynon 30 was stopped and the couple were advised to use a condom and Delfen (nonoxynol) Foam. At laparotomy under x-ray control the Copper 7 was found embedded in the wall of the small intestine and two small incisions were required to remove it. The mucosa was intact, but 40% of the device was within the intestinal wall and the entire device was covered by peritoneum. The patient made an uneventful recovery from the operation but was subsequently found to be pregnant having conceived in the preoperative cycle. Because of the exposure to irradiation the pregnancy was terminated.

**Case 2**—A Copper 7 was fitted in an advisory clinic at the time of menstruation in a single girl aged 21, and she was advised to use Delfen Foam as well. No further period occurred and pregnancy was confirmed. Because of psychiatric problems, a termination was carried out and the laparoscope was used to look for the Copper 7 without success. The patient was readmitted for laparotomy under x-ray control and the Copper 7 was found to be penetrating the wall of the small intestine. It had penetrated the muscle coat but not reached the lumen and was bound down by filmy adhesions. The device was dissected out and the track was oversewn with catgut; the patient made an uneventful recovery and now, three years later, has a wanted intrauterine pregnancy.

**Case 3**—This patient had a Copper T fitted by her general practitioner after the delivery of her second child. She conceived despite this and the Copper T was not found at delivery, which was by emergency caesarean section for a transverse lie with hand presentation. Subsequently the device was removed at laparotomy under x-ray control and was found to be bound down to, but not embedded in, the lower part of the posterior surface of the uterus. It was excised and the peritoneum was repaired. The patient made a satisfactory recovery.

## Comment

None of these devices was inserted in the hospital clinic where plastic devices, mainly Lippe's loops, are used. During the same three year period two plastic IUCDs were removed from the peritoneal cavity: one was lying free and one was wrapped in omentum; both were removed easily. In contrast, the copper-carrying devices were all buried in adhesions and both the Copper 7s had penetrated into the bowel, necessitating excision from and repair of small intestine. In case 1 the history suggests that the device was properly placed in the uterus at the time of insertion as it was effective as a contraceptive for 18 months.

The cases described here give no indication of the incidence of perforations but the figure quoted by Cederqvist and Fuchs<sup>1</sup> for perforations by the Lippe's loop is 0.4/1000. Cederqvist and Fuchs<sup>1</sup> reported two perforations by the Copper T in 880 cases and Newton

*et al.*<sup>2</sup> in their paper evaluating the Copper 7, reported one perforation in 1156 insertions.

These cases are presented to draw attention to the possibility of migration of copper IUCDs and to the necessity for early laparotomy in all cases of intra-abdominal copper-bearing IUCDs. Unless the operation is performed soon after the entry of the copper device into the peritoneal cavity, laparotomy, not laparoscopy, will be needed because of the tendency for dense adhesions to form.

<sup>1</sup> Cederqvist, L. L., and Fuchs, F, *American Journal of Obstetrics and Gynecology*, 1974, **119**, 854.

<sup>2</sup> Newton, J, *et al*, *British Medical Journal*, 1974, **2**, 447.

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## Which anti-inflammatory drugs in rheumatoid arthritis?

The choice of non-steroidal analgesic anti-inflammatory drugs for patients with rheumatoid arthritis is now bewildering. Many of these drugs differ only slightly from each other in their pharmacological properties, yet the response of individual patients to each may be very different, for both efficacy and side effects. Two approaches exist for the medical practitioner: to stick regardless to a few well-known drugs or to parade the patient through a sequence of drugs, often with a minimum of documentation, until the best is found. Faced with patients who have tried several with little apparent effect, I

have evolved a return to rational treatment: the mini-pack, multi-drug patient-assessed clinical trial.

### Methods and results

Any patient with persistent inflammatory joint disease relatively unresponsive to non-steroidal anti-inflammatory drugs is given a single prescription. At the pharmacy four different drugs are issued, with standard instructions on each bottle, together with a combined instruction and self-assessment sheet. A five-day supply of each drug is given, and on the 21st day the patient returns to outpatients or to his general practitioner for a further prescription of the best drug. Should one be ineffective or produce side effects the patient is instructed to move on to the next drug.

Some 50 patients have now completed this procedure with no failures; both doctors and patients have found the system satisfactory.

### Comment

No problems have occurred with the use of the self-assessment sheet, and remarkably, several patients have found that a previously discarded drug is in fact effective. The standard of patient recording has been high in patients of varying intelligence and education. Even those with minimal command of English have coped well. The completed assessment is filed in the hospital notes for future reference.

The choice of non-steroidal anti-inflammatory drugs and dosage is purely personal, and others may easily be substituted. The principle is adaptable to various specialties, and may be adapted for use in general practice.

I thank the pharmacies of Northwick Park and Mount Vernon Hospitals for their co-operation.

(Accepted 10 April 1978)

Northwick Park Hospital, Harrow, and Mount Vernon Hospital, Northwood, Middlesex

J M GUMPEL, BM, MRCP, consultant physician

### PATIENT OBSERVATION FORM (MOUNT VERNON)

Name JOHN SMITH, 3, W  
Hospital No:                     

Date of 1st visit 29.11.77  
Date of 2nd visit 20.12.77

Medication	Soluble aspirin - 300mg					Indomethacin - 25mg					Naproxen - 250mg					Ketoprofen - 50mg					None
	THREE to be taken at breakfast, lunch, tea and dinner in water EC aspirin - 325mg THREE to be taken at bedtime (with a drink and biscuit)					ONE to be taken at breakfast, lunch, and dinner, and THREE or FOUR at bedtime (with a drink and biscuit)					ONE to be taken at breakfast and ONE at night with a drink and biscuit					ONE to be taken three times a day after meals					
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Duration of morning stiffness	2 HRS	2 HRS	2 HRS	2 HRS	3 HRS	2 HRS	0	1 HR	2 HRS	1/2 HR	2 HRS	2 HRS	1 HR	1 HR	1 HR	1/2 HR	1/2 HR	1/2 HR	1/2 HR	1/2 HR	
Pain during day (please tick appropriate box)																					
None																					
Mild								✓	✓	✓					✓	✓	✓	✓	✓	✓	✓
Moderate	✓	✓	✓	✓		✓			✓				✓	✓							
Severe					✓						✓	✓									
Do these tablets/capsules suit you?	Yes					✓	✓	✓	✓	✓						✓	✓	✓	✓	✓	
No	✓	✓	✓	✓	✓						✓	✓	✓	✓							
Any comments?																					

Example of self-assessment form completed by patient.