

previously received chemotherapy. The table shows the details of their treatment. BRL 43694 was inactive at 10 µg/kg, but at 20 µg/kg no vomiting was observed in three patients, although one patient felt nauseous. At 30 µg/kg nausea was considerably reduced, but breakthrough vomiting did occur in two out of three patients. In eight of the 14 patients treated with 40 µg/kg vomiting was prevented. Other antiemetic treatment was necessary for the six other patients, although the onset of vomiting was delayed in three patients beyond 12 hours. In the first six hours after receiving cisplatin only two patients vomited or experienced dry retching. Statistical analysis of the linear analogue scores for nausea showed no significant difference at one, four, and six hours after the infusion when compared with values before the infusion, and global rating scores showed that eight of the 14 patients had no nausea over 24 hours.

Intravenous administration of BRL 43694 was well tolerated in all patients with no toxic reactions. No clinically relevant changes in biochemical results or blood counts were observed, although one patient developed transient renal impairment; inadequate hydration after treatment with cisplatin was thought to be the causal factor. No important abnormalities in pulse rate, blood pressure, or cardiac rhythm were observed.

## Comment

BRL 43694 was given to 22 patients receiving chemotherapy with cisplatin. Fourteen patients received the highest dose (40 µg/kg); eight of them had no nausea or vomiting, and in three of the remaining six the onset of nausea and vomiting was delayed beyond 12 hours. The drug was well tolerated, although headache lasting 36 hours was observed in one patient. Selective serotonin type 3 receptor antagonists would seem to have an important role in the control of emesis induced by chemotherapy. BRL 43694 at a dose of 40 µg/kg given as a single infusion for 30 minutes was safe and noticeably ameliorated nausea and vomiting in patients receiving doses of cisplatin ranging from 40 to 100 mg/m<sup>2</sup>.

- 1 Kris MG, Gralla RJ, Clark RA, *et al.* Incidence, course, and severity of delayed nausea and vomiting following the administration of high-dose cisplatin. *J Clin Oncol* 1985;3:1379-84.
- 2 Bateman DN, Rawlins MD, Simpson JM. Extrapyramidal reactions with metoclopramide. *Br Med J* 1985;291:930-2.
- 3 Fozard JR, Mobarok Ali ATM. Blockade of neuronal tryptamine receptors by metoclopramide. *Eur J Pharmacol* 1978;49:109-12.
- 4 Cunningham D, Pople A, Ford HT, *et al.* Prevention of emesis in patients receiving cytotoxic drugs by GR 38032F, a selective 5-HT<sub>3</sub> receptor antagonist. *Lancet* 1987;i:1461-2.
- 5 Zussman BD, Clarkson A, Coates PE, Rapeport WG. The pharmacokinetic profile of BRL 43694, a novel 5-HT<sub>3</sub> receptor antagonist, in healthy male volunteers. *Br J Clin Pharmacol* 1988;25:107P.

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## Injuries caused by handcuffs

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Compression of peripheral nerves around the wrist resulting from the use of handcuffs has been reported in the United States. The superficial branch of the radial nerve seems to be most commonly affected,<sup>1,4</sup> but the median and ulnar nerves may be affected with both sensory and motor dysfunction.<sup>1,5</sup>

We found no reference to fractures of the radial styloid resulting from handcuffs and believe that the four cases we describe are the first reported instances of injury caused by handcuffs in the United Kingdom.

### Case reports

**Case 1**—A 17 year old man, who had been detained in handcuffs for one to two hours two days previously, presented, with a tight pair of handcuffs around his wrists, with bilateral wrist pain and tenderness. Radiographs showed a fracture of the tip of the right radial styloid.

**Case 2**—A 24 year old man presented two days after being arrested, when his left wrist had been placed in handcuffs, resulting in immediate pain. Radiographs confirmed a fracture of the radial styloid process (figure). Two months later he was again arrested, and both wrists were placed in handcuffs, behind his back, for roughly 20 minutes. There was both subjective and objective loss of sensation on the dorsal aspect of both thumbs but no motor dysfunction, and parallel healing abrasions were present over both wrists.

**Case 3**—A 17 year old man was detained for one to two hours in handcuffs. Initially he complained of numbness affecting the whole of the left hand, but the next day this was limited to the web space between thumb and index finger dorsally with associated objective loss of sensation but no motor dysfunction.

**Case 4**—A 25 year old man was seen 24 hours after he had been restrained in handcuffs with pain in the right hand and altered sensation affecting the palmar and dorsal aspects of the thumb and index and middle

fingers and associated metacarpal regions, including the first dorsal web space, compatible with median and radial neuropathies. There was no motor dysfunction.

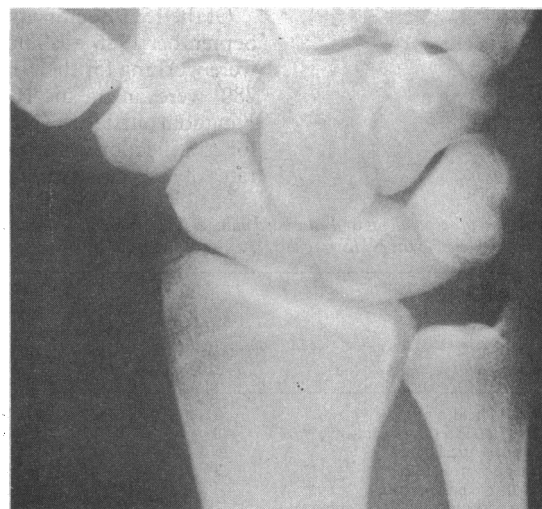
All four patients failed to attend follow up appointments.

## Comment

The superficial branch of the radial nerve is purely sensory and at risk of pressure damage because of its superficial course over the lower end of the radius; it was affected in the patients in cases 2, 3, and 4.

The median and ulnar nerves are also vulnerable to pressure as the adjacent flexor digitorum superficialis and flexor carpi ulnaris have become tendinous at this level,<sup>5</sup> although venous stasis in the carpal tunnel may be a mechanism of median nerve compression.<sup>1</sup> Multiple neuropathy from compression is rare,<sup>5</sup> but both the median and radial nerves were affected in case 4.

The standard handcuffs used by the police in Britain may be applied by flicking an open bar on to the detainee's wrist, allowing the cuff to spring shut on a



Case 2. Fractured tip of radial styloid

ratchet. If the opening bar of the cuff is not applied accurately this could result in a blow to the radial styloid, which lies superficially. Sudden compression inside the metal ring may also be a causal mechanism.

Though further narrowing of the cuff after application may be prevented by tripping a small spring, this is not always possible in the circumstances of an arrest. The handcuffs may tighten if the detainee continues to struggle, resulting in further compression.

We believe that the injuries described were caused by handcuffs and conclude that a claim of pain,

weakness, or altered sensation after the detention of a patient in handcuffs should not be dismissed. Consideration should also be given to preventing such injuries.

- 1 Dorfman LJ, Jayaram AR. Handcuff neuropathy. *JAMA* 1978;239:957.
- 2 Massey EW, Plett AB. Handcuffs and cheiralgia paresthetica. *Neurology* 1978;28:1312-3.
- 3 Appel H. Handcuff related cheiralgia paresthetica. *Neurology* 1979;29:908-9.
- 4 Smith MS. Handcuff neuropathy. *Ann Emerg Med* 1981;10:668.
- 5 Levin RA, Feltenshal G. Handcuff neuropathy: two unusual cases. *Arch Phys Med Rehab* 1984;65:41-3.

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## Employment outside the NHS of doctors registered in the United Kingdom

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Data on the occupation of all civilian doctors were held on the Civilian Doctors' Career Index until it was discontinued in 1982. The Department of Health and Social Security's database on medical manpower now consists only of registration data supplied by the General Medical Council and job information returned yearly by health authorities.

The lack of information makes accurate planning of medical manpower in the United Kingdom difficult. Thus a recent report of the Advisory Committee for Medical Manpower Planning estimated many quantities from scant information,<sup>1</sup> and the consultative document *Hospital Medical Staffing: Achieving a Balance*<sup>2</sup> had been both criticised and defended, partly because of differing estimates of where current graduates from the United Kingdom end up. We report findings on the numbers and activities of currently registered doctors working in the United Kingdom outside the NHS.

### Doctors, methods, and results

A stratified random sample of 1822 of the 43 624 doctors registered on the GMC's principal list in July 1986 whose names were not on the 1985 DHSS census files of doctors working in the NHS were sent a questionnaire asking about their occupations in 1985 and 1986 and their last post in the NHS. Information was received from 1534 (84%) of the doctors and the occupations of a further 55 doctors were taken as those mentioned in the *Medical Directory*.<sup>3</sup>

Of the 1556 doctors in the sample whose status on 30 September 1986 was known, 488 were retired and 359 were working for the NHS. Of the remaining doctors, 280 were in medical employment in the United Kingdom outside the NHS. After weighting to account for stratification of the sample and slight differences in rates of response within these strata, we estimated that

6960 (95% confidence interval 6170 to 7730) doctors were so employed (table). Of these, 990 (14%) were working in private industry, and 1910 (27%) in private medical practice. Of those working full time 1950 (45%) were in private practice or private industry. Of all the 6960 doctors, 4970 (71%) were trained in the United Kingdom and under 65 when they left their last post in the NHS.

Most (5840 (84%)) were men, though nearly 30% of those aged 30-39 were women. Only 26 respondents reported being unemployed at the time of the survey, which, after allowing for stratification and so on, was less than 1% of the "active stock" of doctors in the United Kingdom.

### Comment

Although nearly half the estimated 6960 doctors medically employed in the United Kingdom outside the NHS in 1986 were working in the private sector, the number of doctors under 65 and working full time in the private sector represented only 2% of all medically employed doctors in the United Kingdom in 1986. This is much less than the 7.1% of whole time equivalent qualified nurses working full time in independent hospitals and nursing homes in 1985.<sup>4</sup> Consequently, there may be less pressure on the private sector to contribute to the costs of training doctors than to those of training nurses.

Other longitudinal studies have examined the careers of female doctors in more detail.<sup>5</sup> Nevertheless, as the proportion of female doctors medically employed outside the NHS was lower than that of male doctors except in the age range 30-39 it seems that some female doctors with children may be actively seeking employment outside the NHS, perhaps because the NHS is not providing adequate arrangements for them.

Medical employment in this country cannot reasonably be assumed to be in a steady state, hence our data cannot be used to comment on flows in and out of the NHS. Nevertheless, the data indicate, as might be expected, a substantial loss of doctors from the NHS to medical employment outside the NHS in the United Kingdom.

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Numbers of respondents and estimated numbers (percentages) of doctors in medical employment in the United Kingdom outside the NHS in 1986

Sector	No of respondents (n=280)	Estimated No (%) of doctors			Total (n=6960)
		Employed full time (n=4340)	Employed part time (n=2350)	Not known (n=270)	
Armed forces	58	1160 (27)	140 (6)	20	1320 (19)
Other public service or industry	88	820 (19)	1110 (47)	200	2130 (31)
Pharmaceutical industry	25	480 (11)		20	500 (7)
Other private industry	23	360 (8)	130 (6)		490 (7)
Private medical practice	64	1110 (26)	800 (34)		1910 (27)
University (without NHS contract)	7	120 (3)	40 (2)		160 (2)
Other	15	290 (7)	130 (6)	30	450 (7)

1 Advisory Committee for Medical Manpower Planning. *Report*. London: DHSS, 1985.

2 Department of Health and Social Security, Joint Consultant Committee, Chairman of Regional Health Authorities. *Hospital medical staffing: achieving a balance*. London: DHSS, 1986.

3 *The Medical Directory*. London: Churchill Livingstone, 1985 and 1986.

4 Thomas KJ, Nicholl JP, Williams BT. A study of the movement of nurses and nursing skills between the NHS and the private sector in England and Wales. *Int J Nurs Stud* 1988;25:1-10.

5 Ward AMW. Careers of medical women. *Br Med J* 1982;289:31-3.

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