

No (%) of presenting problems by characteristics of runners (n=409) and location of first-aid stations

	Skin lesion, including blisters	Muscle or joint pain or stiffness	Nausea, diarrhoea, or vomiting	Extreme thirst	Exhaustion, mentally clear	Exhaustion with mental confusion	Cold, rigor, hypothermia	Fatigue or dizziness	Toothache, earache, headache	Other	Not stated	Total (n=672)
Runners												
Sex:												
Male	104 (16)	372 (58)	38 (6)	24 (4)	55 (9)	6 (1)	18 (3)	8 (1)	5 (1)	4 (1)	6 (1)	640 (100)
Female		15 (50)	3 (10)	4 (13)	4 (13)		2 (7)	2 (7)				30 (100)
Not known												2
Age (years):												
18-29	60 (15)	228 (58)	22 (6)	18 (5)	38 (10)	4 (1)	11 (3)	5 (1)	3 (1)	3 (1)	3 (1)	395 (100)
30-39	31 (17)	103 (57)	12 (7)	9 (5)	13 (7)	1 (1)	5 (3)	3 (2)	2 (1)		3 (2)	182 (100)
40+	9 (12)	45 (61)	6 (8)	1 (1)	6 (8)	1 (1)	3 (4)	2 (3)		1 (1)		74 (100)
Not known												21
Previous experience:												
None	74 (16)	281 (62)	20 (4)	16 (4)	35 (8)	2 (1)	9 (2)	7 (2)	4 (1)	2 (1)	6 (1)	456 (100)
Half-marathon	9 (13)	41 (61)	6 (9)	3 (4)	3 (4)	1 (1)	2 (3)	1 (1)		1 (1)		67 (100)
Full-marathon	16 (13)	52 (42)	14 (11)	9 (7)	19 (15)	3 (2)	8 (6)	2 (2)	1 (1)	1 (1)		125 (100)
Not known												24
First-aid stations contacted												
No of miles (km) from start:												
≤9 (14.5)	11 (44)	6 (24)	1 (4)	3 (12)			1 (4)		2 (8)	1 (4)		25 (100)
13 (21)*		3	2			1		1				7
≤18 (29)	29 (32)	55 (61)	1 (1)		1 (1)					1 (1)	3 (3)	90 (100)
20 (32)	6 (5)	96 (81)	5 (4)		5 (5)			1 (1)	2 (2)		3 (3)	118 (100)
23 (37)	9 (9)	76 (76)	3 (3)	1 (1)	7 (7)		3 (3)	1 (1)				100 (100)
25 (40)	4 (5)	60 (75)	2 (3)	12 (15)	2 (3)							80 (100)
26 (42)†	46 (19)	89 (36)	25 (10)	12 (5)	43 (18)	5 (2)	16 (7)	7 (3)	1 (0)	1 (0)		245 (100)
Following bus		2	2		2					1		7

*Finish of half marathon.

†Finish of full marathon.

Comment

Entrants were provided with printed advice about training and dietary preparation, and about who should not participate. One-quarter of the entrants did not run: a follow-up inquiry showed that it was not the heat (24°C) and relative humidity (82%) which deterred them. This no-show rate may therefore be typical of such events.

To plan the first-aid and health service facilities, forecasts of the number of casualties among runners have to be based on what is known about the entrants. Working backwards, in a full marathon the higher the proportion of women, young men, and runners without previous experience the greater the number of casualty problems created. Experienced runners give rise to fewer problems than the inexperienced but the problems presented are more often constitutional. For all runners the yield and complexity of problems increases with the distance run.

Half marathons need create only small casualty work loads: moreover, having a half-marathon option in a longer race provides a useful safety valve, which older, more experienced runners will take to a greater extent than the young and inexperienced. A race with 4500 entrants need not provide much additional work load for the health services.

We thank the South Yorkshire branch of the British Red Cross Society, the organising committee of the Sheffield Marathon, and Mr John Whetton, race director, for the facilities to undertake this study.

¹ Anonymous. Marathon update. *Running Magazine* 1982, June:21.

(Accepted 14 September 1982)

Department of Community Medicine, University of Sheffield Medical School, Sheffield S10 2RX

JONATHAN P NICHOLL, MA, BSC, statistician
BRIAN T WILLIAMS, MD, FFCM, senior lecturer

Medical problems before and after a popular marathon

We report here data on the medical problems experienced by runners preparing for a marathon, the medical sequelae of participating, the demands for medical care these create, and their effects on the ability to work and to fulfil other social functions. The data were obtained from a sample of the 4559 entrants for the Sheffield marathon held in June 1982.

Methods and results

Ten days after the race questionnaires were mailed to random samples (after stratification for age, sex, and previous experience) of about one in six of the 3462 runners and the 1097 entrants who failed to register for the start (non-runners). Those not responding after two weeks received reminders and duplicate questionnaires. The response rates were 80% (147 out of 184) for the non-runners and 91% (557 out of 614) for the runners.

Fifty-two non-runners (35%) gave non-medical reasons for withdrawing, including work and family commitments, and 92 (63%) gave medical reasons, including injury in training (19), other injuries (29), decided not fit enough (24), or other health reasons (20). Withdrawal for medical reasons was not related to age or sex. Three non-runners gave no reason. A medical reason was given less often by those who had previously run a full marathon (16 of 37, 43%) than by those who had run a half marathon (19 of 28, 68%) or neither distance (54 of 74, 73%) ($p < 0.05$). Among those giving medical reasons, injury in training was cited by considerably more men (16 of 68, 24%) than women (two of 21, 10%): the most common injuries were to knee joints (nine cases) and thigh muscles (eight).

Among the runners, pain, discomfort, or illness in the week after the race was reported by 97 (40%) of those who ran the half marathon and 203 (65%) of those who ran beyond this stage. Four others gave no answer; 10 did not run although they registered for the start. Pain or stiffness in leg muscles affected 130 (64%) of the 203 full-marathon runners who reported problems and 61 (63%) of the 97 with problems after running a half marathon. Next most common were joint problems (59 (29%) full marathon, 20 (21%) half marathon), with knee joints particularly affected, and blistered feet (30 (15%) and seven (7%)). Other problems were general malaise (19 (6%) of all 300 with problems), alimentary disorders (12 (4%)) and vertebral column pain (11 (4%)). Four runners caught colds. Most of the disorders were minor. Only 22 runners, 4% of the sample, consulted a doctor.

Similar proportions of men and women at each distance suffered after effects. Older runners fared as well or better than younger ones, and fewer of those who had run a full marathon before developed problems (see table).

Only 32 days' work were lost in the week after the race by the 467 runners who were in full-time employment. Six of the 300 (2%) white-collar workers needed time off, and 10 of the 157 (6%) blue-collar workers. After effects prevented 36 out of 556 respondents (6%) from doing something else of social importance to them, nearly always a form of exercise.

No (%) of runners reporting medical problems after marathon

	Half marathon		p Value	Full marathon		p Value
	No in sample	No (%) reporting problems		No in sample	No (%) reporting problems	
Total:	242	97 (40)		312	203 (65)	
Sex:						
Male	178	70 (39)	NS	283	186 (66)	NS
Female	64	27 (42)		29	17 (59)	
Age (years):						
Under 40	180	80 (44)	$p < 0.05$	239	159 (67)	NS
40+	62	17 (27)		73	44 (60)	
Previous experience:						
None	129	59 (46)	$p < 0.05$	160	114 (71)	$p < 0.01$
Half marathon	63	26 (41)		35	25 (71)	
Full marathon	50	12 (24)		117	64 (55)	

Comment

Based on this sample, an estimated 3% of all entrants were sufficiently incapacitated by a training injury to prevent them from running, and an estimated 59% of all runners suffered some ill effects. These were severe enough to warrant medical care in only a trivial proportion of cases, however, and had little effect on working or social life. The race organisers advised entrants on how to prepare for the race. The small numbers of casualties occurring during the race (see our accompanying paper) and the relative unimportance of the after effects suggest that they took heed of the advice.

Older and more experienced runners were least affected. The increased opportunities that exist to compete in open-entry marathons means that the numbers with previous experience is growing. Even fewer problems before, during, and after the race should result.

We thank the South Yorkshire branch of the British Red Cross Society, the organising committee of the Sheffield Marathon, and Mr John Whetton, race director, for the facilities to undertake this study.

(Accepted 16 September 1982)

Department of Community Medicine, University of Sheffield,
Sheffield S10 2RX

JONATHAN P NICHOLL, MA, BSC, statistician
BRIAN T WILLIAMS, MD, FFCM, senior lecturer

Analgesia after herniotomy in a paediatric day unit

Local analgesia has become an accepted part of anaesthesia for paediatric surgery, particularly for minor surgery that can be planned on a day-stay basis. The most frequently used method is a caudal epidural injection, which has been shown to be effective in patients undergoing circumcision using a low volume of local anaesthetic solution.^{1,2} Pain relief for operations using a groin incision, however, requires a much larger volume of solution.³ We describe the use of ilioinguinal nerve blocks in postoperative analgesia in children undergoing inguinal herniotomy.

Patients, methods, and results

All 120 patients booked for inguinal herniotomy on a surgical day-stay list were studied. Those under 5 years old were given premedication consisting of oral diazepam and droperidol. General anaesthesia was induced either intravenously with thiopentone sodium, 5 mg/kg body weight, or by an inhalational technique, and was maintained with nitrous oxide, oxygen, and halothane breathed spontaneously from a suitable system.

After induction the patients were divided at random into two equal groups: the first group received no local analgesia; the second group had an ilioinguinal block performed using 0.5% bupivacaine without adrenaline, to a total volume of $\frac{1}{2}$ ml/year of age. The major nerve supply to the groin is from the ilioinguinal and iliohypogastric nerves, which lie close together below the external oblique muscle, a finger's breadth from the anterior superior iliac spine. A hypodermic needle was inserted vertically at this point until the aponeurosis of the external oblique was penetrated. After aspiration, the analgesic solution was injected below the aponeurosis, laterally towards the iliac spine and mediocaudally towards the inguinal ligament.⁴

The patients were assessed at one, two, and four hours after operation by one of two experienced nurses, neither of whom knew whether a local analgesic had been given. Paracetamol was also given if the nurses thought it necessary and, if given, this was also noted. The two groups of patients were compared statistically using χ^2 with Yates's correction for small numbers.

Several children underwent operation late in the afternoon and in some

No of patients free of pain (figures in parentheses are number who received additional analgesia in that hour)

Time of assessment	Ilioinguinal block (n = 58)	No block (n = 49)	p Value
1 hour	52 (1)	23 (2)	p < 0.001
2 hours	56 (3)	30 (5)	p < 0.001
4 hours	56 (1)	35 (3)	p < 0.01

cases parents were anxious to take them home. Consequently, results were unobtainable for the assessment at four hours in 13 children, who were excluded from the study. Results were available for 58 patients (mean age 4.7 years, range 1 to 10) who had had ilioinguinal blocks performed and 49 (mean age 4.2 years, range 1 to 10) who had had no analgesia. The table shows the numbers in each group who were pain free at the time of assessment and the numbers who had received additional analgesia. There was a significant difference between the two groups at all times, even allowing for the administration of paracetamol: almost all patients who had had ilioinguinal blocks were free of pain.

Comment

Paediatric day-stay surgery has been established in many centres to minimise the potentially unpleasant experiences of hospitalisation and separation from parents. It is in such patients that local analgesic blocks are particularly useful as they may avoid the necessity for strong analgesics. Individual nerve blocks use a small amount of local anaesthetic and are without the possible complications of the epidural technique. The method described provided analgesia rather than the total anaesthesia of a field block necessary for surgery. The technique is simple and may be performed quickly by either surgeon or anaesthetist.

The amount of pain experienced by children is often difficult to assess, especially in infants who cannot communicate their own feelings. Restlessness is often a sign of pain in the child but may be confused in the early postoperative period with emergence from general anaesthesia. In addition, distress may be caused by reasons other than pain—for example, absence of parents, loss of a favourite toy, or hunger. In this study the nurses, who both worked on the surgical ward, were asked to assess and record whether or not the children were in pain. If a child was restless they had to decide, using their experience, if this was due to pain or another factor.

There was a significant difference between the two groups at all times, even allowing for the administration of paracetamol when required. It was interesting to note that a large proportion of the patients who had had no local analgesic block were assessed as being free of pain despite having had no additional analgesia. This confirmed our impression that herniotomy is not painful for many children and does not justify the routine inclusion of a narcotic analgesic in the anaesthetic technique.

We believe that ilioinguinal nerve block is a simple, safe, and effective technique for the relief of pain after a groin incision in children. It is a useful addition to the techniques used in paediatric day-stay surgery.

We thank Sister L Styles and Staff Nurse L Piddock for their assessment of patients in this study and Mrs C McSheen for secretarial help.

¹ Kay B. Caudal block for post-operative pain relief in children. *Anaesthesia* 1974;29:610-1.

² Lunn JN. Post-operative analgesia after circumcision. *Anaesthesia* 1979;34:552-4.

³ Armitage EN. Caudal block in children. *Anaesthesia* 1979;34:396.

⁴ Von Bahr V. Local anaesthesia for inguinal herniorrhaphy. In: Eriksson E, ed. *Illustrated handbook in local anaesthesia*. London: Lloyd-Luke, 1979:52-4.

(Accepted 24 August 1982)

Department of Anaesthetics, Birmingham Children's Hospital,
Birmingham B16 8ET

BARRY A C SMITH, MB, FFARCS, senior registrar (now at Queen Elizabeth Hospital, Birmingham B15 2TH)

SUSAN E F JONES, MB, FFARCS, consultant anaesthetist

Corrections

Orthogeriatric rehabilitation ward in Nottingham: a preliminary report

An error occurred in this short report by Dr R V Boyd and others (2 October, p 937). The heading to the table should have read: "Number of all female patients admitted with fractured neck of femur to Nottingham hospitals in 1979 compared with 1977."

Campylobacter colitis associated with erythema nodosum

An error occurred in this paper by Dr M E Ellis and others (2 October, p 937). The second sentence of the second paragraph of the Comment section should have read: "Erythema nodosum with infective bowel disease has previously been reported only in yersinia infections."