15 Do you have sufficient resources to provide adequate counselling for all patients who are offered amniocentesis/chorionic villus sampling?

Yes . . . 1 No . . . 2

- 1 Wald N, Wald K, Smith D. The extent of Down's syndrome screening in Britain in 1991. *Lancet* 1992;340:494.
- 2 Green JM. Ethics and late termination of pregnancy. *Lancet* 1993;342:1179.
- 3 Green JM. Women's experiences of prenatal screening and diagnosis. In:

- Abramsky L, Chapple J, eds. *Prenatal diagnosis: the human side*. London: Chapman and Hall, 1994:37-53.
- 4 Statham H, Green J. Serum screening for Down's syndrome: some women's experiences. *BMJ* 1993;307:174-6.
 - 5 Nuffield Council on Bioethics. *Genetic screening: ethical issues*. London: Nuffield Council on Bioethics, 1994.
 - 6 Green JM. *Calming or harming: a critical review of psychological effects of fetal diagnosis on pregnant women*. London: Galton Institute, 1990. (Occasional papers, second series, No 2.)
 - 7 Marteau T, Slack J, Kidd J, Shaw R. Presenting a routine screening test in antenatal care: practice observed. *Public Health* 1992;106:131-41.
- (Accepted 18 July 1994)

Audit of requests for preoperative chest radiography

Duncan Walker, Paul Williams, Julian Tawn

Department of Radiology,
Royal Bournemouth
General Hospital,
Bournemouth BH7 7DW
Duncan Walker, senior
registrar in radiology
Paul Williams, senior registrar
in radiology
Julian Tawn, consultant
radiologist

Correspondence to:
Dr D Walker, Department
of Radiology, Southampton
General Hospital, Tremona
Road, Southampton
SO9 4XY.

BMJ 1994;309:772-3

Requests at our hospital for preoperative chest radiography were increasing but radiology staff did not know whether the increase was related to a change in workload or in clinical practice. We determined the rate of requests for preoperative radiography in patients undergoing elective surgery and the impact of such an investigation on subsequent clinical management.

Methods and results

From 12 to 26 June 1992 we audited all admissions in all specialties of patients due to have elective surgery. We put preoperative chest radiographs in labelled envelopes, which were then sealed with staples; these envelopes were put in radiography packets, which the patients took back to the ward. The packets were returned to the radiology department after the patients had been discharged. If the staples on an envelope had been removed we concluded that the radiograph had been reviewed.

We disseminated the results of this study at departmental audit meetings in surgery, anaesthetics, and radiology. After discussion among staff, revised guidelines, based on advice from the Royal College of Radiologists,¹ were issued to doctors and displayed on all surgical wards (box). Radiology staff were encouraged to challenge apparently inappropriate requests. We then assessed the rate of requests for preoperative chest radiography from 21 June to 2 July 1993.

The overall rate of requests for preoperative chest radiography fell from 24% (102/430) in 1992 to 7% (54/725) in 1993. The 1992 request rate from the urology department (44% (38/86)) was the highest of all the specialties and fell the most, to 2% (4/169). The request rate from the general or vascular surgery department fell from 32% (49/154) to 11% (23/213), but the rates from the gynaecology and orthopaedics departments changed little (6% (5/90) and 10% (10/100) respectively in 1992; 8% (8/104) and 9% (17/182) respectively in 1993). The request rate from the ophthalmology department, transferred to this hospital after June 1992, was 4% (2/57).

In 1992, 77 of the 102 (75%) radiography packets were returned to the radiology department with the staples intact on the envelopes holding the radiographs. These radiographs could not therefore have been reviewed. We assumed that the remaining 25 (25%) radiographs had been reviewed preoperatively; the rate of opened envelopes ranged from 0% (0/5) for the gynaecology department to 40% (4/10) for the orthopaedics department. In 1993 the number of preoperative chest radiographs performed was too low

(five a day) for us to repeat reliably the study of the proportion of opened envelopes.

Comment

Increasing emphasis on the efficient use of inpatient beds has resulted in a rise in day case surgery and has reduced length of admission for elective procedures. House officers overinvestigate patients before surgery, particularly with respect to chest radiography.² In our 1992 audit all requests for radiography from the orthopaedics and gynaecology departments were made by senior house officers and those from urology and general or vascular surgery departments by preregistration house officers. The higher request rates for urology and general or vascular surgery (44% and 32% respectively) compared with those for orthopaedics and gynaecology (10% and 6% respectively) suggest that inexperience or inadequate supervision may influence the degree of investigation.

A 1979 study of elective surgical patients found that the rate of requests for preoperative chest radiography at eight hospitals ranged from 12% to 54% (mean 30%), with wide variation among specialties (from 47% in general surgery to 13% in gynaecology).³ Our 1992 findings were similar.

It is surprising that at least 75% of radiographs during the 1992 audit were not examined despite being available on the wards and in theatre. These

Guidelines for preoperative chest radiography

The Royal College of Radiologists' guidelines for preoperative chest radiography among patients admitted for elective non-cardiopulmonary surgery state that routine chest radiography is no longer justified. This investigation may be clinically desirable, however, in certain patients in the following categories:

- Those with acute respiratory symptoms
- Those with possible metastases
- Those with suspected or established cardio-respiratory disease who have not had chest radiography in the past 12 months
- Recent immigrants from countries where tuberculosis is still endemic and who have not had chest radiography in the past 12 months

Preoperative chest radiography will also be performed in the following categories of patients:

- Those with a recent history of chest trauma
- Those whose operation may involve a thoracotomy
- Heavy smokers who have not had chest radiography in the past 12 months
- Patients not included in the above categories if the request is made by the appropriate anaesthetist

It should be noted that none of the above categories of request is routine, and therefore the reasons for chest radiography should always be stated on the request card.

radiographic investigations did not benefit patients. Radiology staff enforced the guidelines that were issued to other staff in September 1992 and also rejected request cards on which the only information provided was "pre-op." The rate of requests for preoperative chest radiography fell from 24% to 7%, which represents an annual reduction of nearly 3500 examinations. We can monitor the rate of preoperative chest radiography easily, using computers both in the radiology department and in the operating theatres; we intend to keep the rate at or below 7%.

We thank our radiography and clerical colleagues for their essential contribution.

- 1 Royal College of Radiologists Working Party (1993). *Making the best use of a department of clinical radiology: guidelines for doctors*. 2nd ed. London: RCR, 1993.
- 2 Power KJ, Norman J. Pre-registrant house surgeons. A questionnaire study of anaesthesia—related knowledge and approach to preoperative investigations. *Anaesthesia* 1992;47:518-22.
- 3 Royal College of Radiologists. Pre-operative chest radiology: a national study by the Royal College of Radiologists. *Lancet* 1979;ii:83-6.

(Accepted 20 May 1994)

Later effects of grounding of tanker *Braer* on health in Shetland

D Campbell, D Cox, J Crum, K Foster, A Riley

Scottish Centre for Infection and Environmental Health, Ruchill Hospital, Glasgow G20 9NB

D Campbell, consultant in public health medicine

Shetland Health Board, Brevick House, Lerwick, Shetland ZE1 0RB

D Cox, director of public health

J Crum, research associate

Grampian Health Board, Aberdeen AB9 1RE

K Foster, senior registrar

Lothian Health Board, Edinburgh EH8 9RS

A Riley, senior registrar

and the Shetland Health Study group

Correspondence to: Dr Campbell.

BMJ 1994;309:773-4

The public health response to the oil spillage from the tanker *Braer* in January 1993 included a cohort study to examine its effects on health.¹ The first phase has been reported.² We report longer term effects.

Subjects, methods, and results

In June 1993 participants in the first phase were given an extended questionnaire. A systematic sample of non-participating exposed people was surveyed by telephone. Participants aged 16 and over completed the general health questionnaire (28 questions).³ Weight, peak expiratory flow, urine analysis, haematology, and liver and renal function were measured. For categorical data χ^2 values or Fisher's exact tests with two tailed probability were computed; testing of hypotheses was performed by determining odds ratios and confidence intervals by using discordant pairs when applicable. For continuous data, means and mean differences for paired data and their 95% confidence intervals were calculated.

Overall, 344 of the original 420 subjects (80%) and 77 of the 92 controls (84%) participated. The distribution of sex and age and the proportions exposed inside and outside were no different from the first phase. Sixteen of the 76 (21%) non-responders surveyed did not differ in distributions of sex and age from participants. Of exposed people, 7% (25/334) perceived their health to be poor compared with none of the 77 controls ($\chi^2=8.05$, $df=3$, $P<0.05$). Significantly more considered it to have altered since the incident, 16% (54/334) reporting deterioration and 2% (7/334) improvement whereas only 3% (2/77) of controls described deterioration ($\chi^2=11.80$, $df=1$, $P<0.001$). Of exposed people, 6% (21/334) attributed the change to the *Braer*, with 3% (9/334) reporting both poor

health and a decline in health; the remainder, though reporting deterioration, still considered it to be good.

Comparison of the symptoms of exposed people in the two weeks before this phase with their presence immediately after the incident showed more tiredness (odds ratio 1.86, 95% confidence interval 1.19 to 2.92) and fever (2.25, 1.14 to 4.44), fewer throat (0.45, 0.31 to 0.66), skin (0.38, 0.20 to 0.70), and eye irritations (0.18, 0.10 to 0.32), and fewer headaches (0.55, 0.36 to 0.83). More controls had tiredness (4.00, 1.13 to 14.17) and headaches (5.50, 1.22 to 24.81) in June than after the event. In June exposed people were more likely to report throat irritation (3.37, 1.33 to 9.05) and breathlessness on exertion (4.81, 1.09 to 29.92) in the previous 14 days. A greater proportion of those exposed reported weakness (9.18, 1.32 to 182.96) at some time over the five months (table). Eighty six per cent (31/36) declared these symptoms to be persisting, with one third describing their onset in January. There were no differences in perception of health and onset of symptoms between the non-responders and participants.

The mean general health questionnaire score of those exposed (2.92, 2.33 to 3.50) was significantly greater than that of controls (0.83, 0.25 to 1.41). A greater proportion of exposed subjects (60/254, range 0-25) was above the threshold score compared with controls (2/59, range 0-13) ($\chi^2=9.15$, $df=1$, $P<0.003$). The mean scores for those exposed inside (2.71, 2.05 to 3.37) or outside (3.42, 2.27 to 4.61) did not differ. Those exposed had greater overall scores compared with controls for somatic symptoms (1.15 (0.92 to 1.38) *v* 0.29 (0.10 to 0.48)) and anxiety and insomnia (0.83 (0.63 to 1.03) *v* 0.19 (0.02 to 0.36)) but not for personal dysfunction and severe depression. Among the biological markers examined only aspartate aminotransferase activity was different between the two phases (0.40 (-0.38 to 1.18) *v* -1.79 (-2.83 to -0.76)) but not between type of exposure.

Comment

Any overreporting of self reported symptoms would tend to magnify possible health effects. Although the drop out rate between the two studies was appreciable, the telephone survey showed no differences in demography, symptoms, or exposure. The health of exposed participants and controls was similar, though probable upper respiratory infection was detected. A greater proportion of exposed people considered their health to have deteriorated, but only nine reported it as poor because of the incident.

The finding that both groups were more tired in June and the greater proportion of exposed people reporting weakness are unexplained. Whether a physical abnormality is being measured is arguable as only four people reported problems with work. The few women who were pregnant or conceived during the incident delivered without adverse outcomes (M Hunter, C Rowlands, personal communication).

Human disasters are recognised as causes of long

Numbers of people reporting symptoms with onset since *Braer* incident by type of exposure

Symptom	Exposed (n=334)	Controls (n=77)	Odds ratio (95% confidence interval)	Exposure		Odds ratio (95% confidence interval)
				Inside (n=252)	Outside (n=82)	
Bruising	10	2	1.16 (0.23 to 7.82)	8	2	1.31 (0.25 to 9.14)
Infections	44	7	1.52 (0.62 to 3.86)	32	12	1.04 (0.48 to 2.27)
Unsteadiness	12	1	2.83 (0.37 to 59.19)	9	3	0.98 (0.23 to 4.67)
Weakness	36	1	9.18 (1.32 to 182.96)	25	11	0.71 (0.32 to 1.63)
Cramps	18	2	2.14 (0.46 to 13.63)	12	6	0.63 (0.21 to 1.97)
Eyesight problems	11	2	1.28 (0.26 to 8.53)	10	1	3.35 (0.43 to 70.95)
Work affected	4	2	0.45 (0.07 to 3.64)	2	2	0.32 (0.03 to 3.23)
Wheezing	20	1	4.84 (0.67 to 98.34)	13	1	0.58 (0.21 to 1.68)
Breathless at rest	7	1	1.63 (0.20 to 35.78)	3	4	0.23 (0.04 to 1.27)
Breathless on exercise	13	1	3.08 (0.41 to 63.98)	9	4	0.72 (0.20 to 2.87)