responders and responders, the statistical power of this analysis was low, and the authors' main conclusion is based on the responses of only 54 patients. We wonder how many of the 31 non-responders would have had to be unsatisfied with the operation to reverse the results of the statistical analysis. We suspect that it would not be many.

JAYANT S VAIDYA
Research fellow
NIGEL SACKS
Consultant surgeon

Academic Department of Surgery,
Royal Marsden Hospital,
London SW3 6JJ

1 Klassen A, Fitzpatrick R, Jenkinson C, Goodacre T. Should breast reduction surgery be rationed? A comparison of the health status of patients before and after treatment; postal questionnaire survey. *BMJ* 1996;313:454-7. (24 August.)

Interventions requested for psychological reasons should be studied

EDITOR,—We were interested to note that Anne Klassen and colleagues chose to look at breast reduction as an example of a cosmetic surgery procedure that is not being provided by the NHS.¹ They comment that common reasons for referral were physical problems (for example, pain, discomfort, and skin irritation); psychological and social reasons were less common. They conclude that breast reduction is an effective treatment for these women. We question the relevance of this study to the debate on rationing, and particularly whether the findings can be taken to indicate the benefits likely to come from other cosmetic surgery procedures.

South and West Devon Health Authority has operated a policy of restricted access to certain cosmetic surgery procedures, including breast reduction, for over a year. Under this policy requests for breast reduction because of physical symptoms have invariably been approved; such requests constitute a small proportion of the requests for cosmetic surgery (table 1).

Table 1 — Proportion of requests for breast surgery accepted by South and West Devon Health Authority, 1 January to 30 June 1996

Procedure	No of requests	No (%) accepted
Breast reduction:		
Physical symptoms	24	24 (100)
Psychological symptoms	10	6 (60)
Other cosmetic surgery*	84	49 (58)
Total	118	79 (67)

*Including, for example, breast augmentation, removal of cysts and tattoos, rhinoplasty, and apronectomy.

Of greater relevance to the rationing debate is the effectiveness of other procedures, such as breast augmentation, when the reasons for referral are psychological. We hope that future studies will address the issue of effective interventions, including non-surgical management, for such psychological need.

MARGARET SOMERVILLE
Consultant, public health department
GINA RADFORD
Team leader, incident room
NICOLA HEWS
Information officer

South and West Devon Health Authority,
Dartington TQ9 6JE

1 Klassen A, Fitzpatrick R, Jenkinson C, Goodacre T. Should breast reduction surgery be rationed? A comparison of the health status of patients before and after treatment; postal questionnaire survey. *BMJ* 1996;313:454-7. (24 August.)

Authors' reply

EDITOR,—We share Jayant S Vaidya and Nigel Sacks's concern about the response rate in our study. Space did not allow us to report the reasons for 10 patients being excluded from the preoperative assessment. Three respondents had the operation done privately; the questionnaires of two respondents were returned by the post office because they had moved; two respondents had their operation before completing the pre-operative questionnaire; the solicitor of one patient asked that she be removed from the survey because of a legal case pending against the hospital; one respondent proved to be under the minimum age for entry to the study; and one respondent decided that she no longer wanted surgery.

To assess further any possible biases in the results produced by non-response we have performed logistic regression, with whether patients responded to the follow up questionnaire as dependent variable and using a model of all the available health status data from the baseline assessment and demographic and waiting time variables. The model did not fit the data, which suggests that there was no obvious overall bias in terms of follow up. Furthermore, even if every woman who failed to respond to the follow up survey was dissatisfied with the result of her surgery (an implausible assumption), overall 68% (50/74) would have regarded the outcome as excellent or good.

We agree with Margaret Somerville and colleagues that caution is needed in generalising from breast reduction to other forms of cosmetic surgery. Patients awaiting breast reduction surgery represented a quarter of referrals to plastic surgeons for possible cosmetic procedures in Oxford region in 1993. In an assessment of 198 patients having a wider range of cosmetic surgical procedures those who had breast reduction surgery had the worst scores on the physical and pain dimensions of the short form 36 before surgery and, six months postoperatively, showed the most benefit in terms of effect sizes for these dimensions.¹ They also experienced the greatest improvement in psychological wellbeing—as reflected by the 28 item general health questionnaire.

RAY FITZPATRICK
Professor
ANNE KLASSEN
Research officer
CRISPIN JENKINSON
Deputy director, health services research unit

Department of Public Health and Primary Care,
University of Oxford,
Radcliffe Infirmary,
Oxford OX2 6HE

TIM GOODACRE
Consultant plastic surgeon

Department of Plastic and Reconstructive Surgery,
Radcliffe Infirmary

1 Klassen A, Jenkinson C, Fitzpatrick R, Goodacre T. Patients' health related quality of life before and after aesthetic surgery. *Br J Plast Surg* 1996;49:433-8.

Fatal methadone overdose

Better understanding of body's handling of methadone is needed

EDITOR,—T J Hendra and colleagues describe a case in which postmortem concentrations of methadone were substantially higher than those in a sample of blood taken, by our calculations, about 28 hours before death.¹ They speculate that this indicates either delayed absorption from the gut or surreptitious consumption of methadone after admission to hospital. We suggest that the liver might have had a role.

Experimental studies show that the liver avidly extracts methadone from blood, stores some of it unchanged, and can release it back into the effer-

ent bloodstream.² Handling of methadone is altered in chronic liver disease,³ and methadone itself may be hepatotoxic.⁴ We have found it impossible to guess what effect these three phenomena might have in concert, but we suspect that, given the correct stimulus, the liver might be capable of releasing substantial amounts of methadone into the bloodstream long after ingestion. Perhaps that stimulus might be the improvement in the patient's general condition engendered by intensive care.

A further factor that confounds interpretation is the observation that blood methadone concentrations at different sites at necropsy may differ by a factor of over three in a single subject and that no systematic relation exists between the concentrations at different sites.⁵ In addition, methadone is likely to be released by autolysis from those cells that concentrated it during life.² It is thus difficult to interpret blood methadone concentrations at necropsy and to be sure that there was more methadone in the circulation in Hendra and colleagues' patient at death than in the sample of blood taken on the day of admission. Better understanding of the body's handling of methadone is needed.

MYMR W BENBOW
Senior lecturer in pathology
IAN S D ROBERTS
Lecturer in pathology

University of Manchester,
Manchester M13 9PT

ALISON CAIRNS
Registrar in pathology

Leeds General infirmary,
Leeds LS1 3EX

- Hendra TJ, Gerrish SP, Forrest ACW. Fatal methadone overdose. *BMJ* 1996;313:481-2. (24 August.)
- Kreek MJ, Oratz M, Rothschild MA. Hepatic extraction of long- and short acting narcotics in the isolated perfused rabbit liver. *Gastroenterology* 1978;75:88-94.
- Novick DM, Kreek MJ, Fanizza AM, Yankovitz SR, Gelb AM, Stenger RJ. Methadone disposition in patients with chronic liver disease. *Clin Pharmacol Ther* 1981;30:353-62.
- Jover R, Ponsoda X, Gomez-Lechon MJ, Castell JV. Potentiation of heroin and methadone hepatotoxicity by ethanol: an in vitro study using cultured human hepatocytes. *Xenobiotica* 1992;22:471-8.
- Levine B, Wu SC, Dixon A, Smialek JE. Site dependence of postmortem blood methadone concentrations. *Am J Forensic Med Pathol* 1995;16:97-100.

Naloxone infusion should have been started earlier

EDITOR,—We wish to make several points about the case of fatal methadone overdose reported by T J Hendra and colleagues.¹ The initial management of the patient causes us particular concern. Flumazenil was relatively contraindicated in the patient because he was known to have epilepsy and there was a high probability of a mixed overdose, given his access to other drugs and his history; such patients are commonly dependent on benzodiazepines.^{2 3}

In opiate poisoning an initial bolus of 0.8-2 mg of naloxone is recommended; this should be repeated to a maximum of 10 mg before other drugs causing depression of the central nervous system are considered.⁴ The naloxone infusion should have been started earlier, given the extended half life of methadone; the use of occasional boluses is hazardous. Once the infusion was started the rate of infusion remained inadequate, with supplemental boluses being required.

After transfer to the general ward the patient died at some point a few hours after the naloxone infusion stopped. The comment that "the naloxone infusion was slow to complete, eventually finishing at 0330" is unfortunate, implying that a course of treatment had been concluded after a notional timescale, without reference to the patient's clinical status. Given the short half life of naloxone, the danger period could have been predicted to occur in the few hours after the