trials that disregard patients' different pathological and clinical states[3 11] or that include drastically different treatment arms[3 12] can hardly be expected to appeal to well informed participants.

Research, planning, and audit committees should include women with breast cancer to help the other members appreciate the range of women's experience and knowledge.[13] There are so many women with breast cancer that finding ones with the type of expertise and experience appropriate to the committee's task should be easy.[14] That breast cancer is so common is not an enviable attribute, but, for understanding and working with patients' views, it is a convenient one.

CHARLOTTE WILLIAMSON
Vice-chair

York Health Services NHS Trust,
York YO3 7BY

1 Batt S. *Patient no more: the politics of breast cancer.* London: Scarlet Press, 1994.
2 Hancock S. Foreword. In: Goodare H, ed. *Fighting spirit: the stories of women in the Bristol breast cancer survey.* London: Scarlet Press, 1996.
3 Alderson P, Madden M, Oakley A, Wilkins R. *Women's views of breast cancer treatment and research. Report of a pilot project 1993.* London: University of London, Social Science Research Unit, 1994.
4 Williamson C. *Whose standards? Consumer and professional standards in health care.* Buckingham: Open University Press, 1992.
5 Kee F. Patients' prerogatives and perceptions of benefit. *BMJ* 1996;312:958-60.
6 Pickering A, Broadley P. *Health care needs of women with breast cancer—users' views. Research report.* York: North Yorkshire Health Authority, 1995.
7 Swindon and District Community Health Council. *"You're always asking questions," a survey of users of local breast cancer services in 1994 in Swindon.* Swindon: Swindon and District CHC, 1995.
8 Luker KA, Beaver K, Leinster SJ, Glynn Owens R. Information needs and sources of information for women with breast cancer: a follow-up study. *J Adv Nurs* 1996;23:487-95.
9 Kennedy I. *Treat me right: essays in medical law and ethics.* Oxford: Clarendon Press, 1988.
10 Angell M. Patients' preferences in randomized clinical trials. *N Engl J Med* 1984;310:1385-7.
11 Charlton BG. Megatrials are based on a methodological mistake. *Brit J Gen Pract* 1996;46:389-93.
12 Thornton H M. Breast cancer trials—a patient's viewpoint. *Lancet* 1992;399:44-5.
13 Goodare H, Smith R. The rights of patients in research. *BMJ* 1995:310:1277-8.
14 Williamson C. A manager's guide to consumers. *Health Service Journal* 1995;105:28-9.

Phytoestrogens and soy based infant formula

Risks remain theoretical

Soy protein is one of the cheapest sources of protein and has been used as a substitute for cow's milk since the turn of the century. Soy based infant formulas have been available in Britain for over 20 years and account for about 7% of infant formula sales (compared with 13% in New Zealand (C Wham, personal communication) and 10-20% in the USA).[1] This represents gross sales in Britain of £10m annually. However, with rates of initial breastfeeding of only about 63%,[2] many infants will be fed a soy based formula at some time in their first year of life.

Plant protein sources such as soy are quite complex and very different from milk proteins found in most infant formulas. Soy is a rich source of phytoestrogens, non-steroidal oestrogens of the isoflavone class.[3] These compounds are structurally similar to oestrogens; they bind to oestrogen receptor sites and behave as partial oestrogen agonists and antagonists.[4] It is unclear whether these effects are beneficial or detrimental to health, and there are virtually no data on their oestrogenic effects in children. The safety of these formulas has recently been questioned, and the chief medical officer has written to all doctors advising them on the issue.[5]

Epidemiological studies of populations whose diets contain high levels of soy show that they have a lower incidence of and mortality from hormone dependent cancers such as cancer of the breast and prostate.[6 7] In vitro studies have shown that genistein and diadzein, two isoflavones found in soy, can inhibit the growth of breast cancer[8] and prostate cancer tissue.[9] Conversely, dietary oestrogens from soybean products have been implicated as a possible cause of infertility and liver disease in some animal species, although these effects seem to be species specific.[10]

In adults faecal excretion of isoflavones is only 1-2% of the amount ingested, implying there is a significant absorption of ingested isoflavones.[11] A diet with 60 g of soy protein a day, which contains 45 g of isoflavones, affected the menstrual cycle and levels of luteinising hormone and follicle stimulating hormone in adult premenstrual women.[12] On a weight for weight basis, neonates fed recommended amounts of soy based formula would be consuming between three and five times that amount of isoflavones. These formulas are usually their sole source of nutrition for the first three to six months of life until other foods are introduced, yet paediatricians and paediatric endocrinologists do not see large numbers of infants with feminisation. The hypothalamic-pituitary-gonadal axis is much more active in neonates than in older children and adults, which may limit the neonatal response to these apparently high levels of oestrogen-like compounds. However, the long term effects are unknown.

In the meantime how should doctors and other health professionals advise parents? Obviously breastfeeding is best for babies. If mothers do not breastfeed their babies, they should use a recognised cow's milk based formula unless there are valid reasons not to do so. Since the carbohydrate in soy based formulas comprises sucrose or glucose polymers rather than lactose, it would be appropriate to use these formulas for galactosaemia and lactose intolerance (either primary or secondary). Parents who are vegans may choose to use a soy based formula for their infants as it contains no animal products.

Indiscriminate swapping between formulas, often on the advice of health professionals, should be avoided, as should spurious recommendations to use a soy based formula for vague symptoms and signs.[13] These include normal crying-fussing behaviour of young infants, colic, and rashes, any of which may be ascribed to cow's milk protein intolerance. Casual treatment in this manner is undesirable because it leads to overdiagnosis of food allergy, with possible long term effects on children's dietary habits and calcium intake. The diagnosis of gastrointestinal cow's milk protein intolerance should not be made without careful evaluation by an expert in the field. When it has been proved, infants should be fed formulas containing protein hydrolysates rather than soy based formula, as soy protein is also a potential allergen.[14] Soy based formula should not be given routinely as prophylaxis to infants thought to be at risk of developing allergy or atopy. The evidence to support this practice is conflicting.[15]

In the short term the theoretical hazards for infants of consuming phytoestrogens in soy based formulas have not been recognised clinically. More research is needed into both the immediate and long term effects of soy based formulas. However, in the meantime, parents whose babies are satisfied and thriving on a soy based formula should not change to another formula.

CHARLES ESSEX
Consultant community paediatrician

Child Development Unit,
Gulson Hospital,
Coventry CV1 2HR

1 Gillooly M, Torrance JD, Bothwell TH, MacPhail AP, Derman D, Mills W, *et al.* The relative effects of ascorbic acid on iron absorption from soy-based and milk-based infant formulas. *Am J Clin Nutr* 1984;40:522-7.

2 Office of Population Censuses and Surveys. *Infant feeding 1990.* London: HMSO, 1992.
3 Setchell KRD, Welsh M, Lim CK. High performance liquid chromatographic analysis of phytoestrogens in soy protein preparations with ultraviolet, electrochemical and thermospray mass spectrometric detection. *J Chromatogr* 1987;386:315-23.
4 Setchell KDR, Aldercreutz H. Mammalian lignans and phytoestrogens: recent studies on their formation, metabolism and biologic role in health and disease. In: Rowland IA, ed. *The role of gut microflora in toxicity and cancer.* New York: Academic Press, 1988: 15-45.
5 Chief Medical Officer. *Phytoestrogens in soya infant formula milk.* London: Department of Health, 1996. (CEM/CMO/96/8.)
6 Smith RL. Recorded and expected mortality among the Japanese in the United States and Hawaii, with special reference to cancer. *J Natl Cancer Inst* 1956;17:459-73.
7 Dunn JE Jr. Cancer epidemiology in the United States—with emphasis on Hawaii and California—and Japan. *Cancer Res* 1975;35:3240-5.
8 Peterson TG, Barnes S. Genistein inhibition of the growth of human breast cancer cells: independence from estrogen receptors and the multi-drug resistance gene. *Biochem Biophys Res Commun* 1991;179:661-7.
9 Peterson TG, Barnes S. Genistein and biochanin A inhibit the growth of human prostate cancer cells but not epidermal growth factor receptor tyrosine autophosphorylation. *Prostate* 1993;22:335-45.
10 Setchell KDR, Gosselin SJ, Welsh MB, Johnston JO, Balisteri WF, Kramer LW, *et al.* Dietary estrogen—a probable cause of infertility and liver disease in captive cheetahs. *Gastroenterol* 1987,93:225-33.
11 Xu X, Wang H-J, Murphy PA, Cook L, Hendrich S. Diadzein is a more bioavailable soymilk isoflavone than is genistein in adult women. *J Nutr* 1994;124:825-32.
12 Cassidy A, Bingham S, Setchell KDR. Biologic effects of a diet of soy protein rich in isoflavones on the menstrual cycle of premenopausal women. *Am J Clin Nutr* 1994;60:333-40.
13 Forsyth BWC, McMarthy PL. Problems of early infancy, formula changes, and mothers' beliefs about their families. *J Pediatr* 1995;106:1012-7.
14 Eastham EJ. Soy protein allergy. In: Hamberger RN, ed. *Food intolerance in children.* New York: Raven, 1989:223-36.
15 Miskelly FG, Burr ML, Vaughan-Williams E, Fehily MA, Butland BK, Merrett TG. Infant feeding and allergy. *Arch Dis Child* 1988;59:323-5.

Vetting new technologies

Those whose efficacy and safety have not been established will now be registered and evaluated

While it is compulsory to evaluate drugs before their widespread use is permitted, other medical interventions are not subject to the same constraints. This has allowed a tidal wave of new health care technologies, which have diffused through health care systems before (or in spite of) proper evaluation to establish safety, effectiveness, or return on investment. This haphazard and uncontrolled adoption of procedures was brought to public attention most recently by the unseemly haste with which laparoscopic surgical techniques were adopted, the associated cases of severe complications,[1] and the increased costs.[2] The routine use of ultrasound during early pregnancy despite little evidence of benefit[3] and the proliferation of unevaluated hip prostheses[4] are other examples of the way in which health technologies or their modification can spread without sufficient caution. Highly publicised experiments with procedures such as xenotransplantation and fetal surgery are further raising professional and public concern.

The uncritical and often uncoordinated adoption of health technologies led the government's Advisory Committee on Science and Technology (ACOST) to recommend the establishment of "a committee on safety and efficacy of procedures to review and register novel surgical procedures" on the model of the Committee for Safety of Medicines.[5] The Department of Health rejected this model and instead passed the problem on to the fledgling NHS Research and Development Programme.[6] The Standing Group on Health Technology established a working group to consider ways of promoting, monitoring, and controlling the adoption of new surgical procedures. After consultation with the royal colleges, the Department of Health has now funded a voluntary system of registration, established under the auspices of the medical royal colleges.

The Safety and Efficacy Register of New Interventional Procedures (SERNIP) will develop a method for identifying and registering procedures (initially in surgery, gynaecology, radiology, and cardiology) whose efficacy and safety have not been established and advising on how they can be evaluated. The register will coordinate information on new interventional procedures from the royal colleges, research funders, and the research literature and will categorise procedures according to the evidence. It will also advise the NHS Health Technology Assessment Programme on priority procedures in need of further assessment.

This important initiative will be watched with interest internationally since no equivalent mechanism on a national scale seems to exist. It raises several fundamental questions, the answers to which will determine the register's potential usefulness and success. First, how does one distinguish a new procedure from a minor modification of an existing procedure of proved efficacy? Second, how safe or effective will a procedure have to be for it to be regarded as being suitable for routine use? What strength of evidence will be required? Who will decide, and how will the possible relation between skills, training, and outcome be taken into account? Third, how will the status of interventions be reviewed in the light of the results of more general and longer term use? The register might support recent calls for reliable nationally coordinated systems of audit for monitoring the outcomes of care on a routine basis. Fourth, what incentives are there for innovative doctors to adhere to the proposed system? Will there be penalties for using techniques that are not established as efficacious outside an approved evaluation? Would the guilty clinicians lose college membership or would purchasers who are not sufficiently vigilant lose resources? Will diffusion be sufficiently controlled by a voluntary system? Local ethics committees might assist by seeking evidence that the register had been consulted. Accountability might also be increased by ensuring that patients and their representatives have access to the register. Fifth, the register will concentrate exclusively on safety and efficacy at a time when the agenda for national health technology assessment and international guidelines for regulation of drugs concentrate on effectiveness and cost effectiveness. Will use of techniques be encouraged when there is evidence of efficacy and safety irrespective of outcomes of routine use or economic consequences?

Given the current pace, haphazard diffusion, and cost of innovation, the NHS cannot continue to indulge doctors' unjustified preferences or fashions. In 1900 Ernest Codman developed a system for reporting the end results of surgical care, much to the indignation of the American medical establishment and his own professional detriment.[7] Nearly 100 years later we have the opportunity to pick up the baton.[8] To succeed will require Codman's courage, critical insight, sense of responsibility, and honesty.

TREVOR A SHELDON
NHS Centre for Reviews and Dissemination,
University of York,
York YO1 5DD

ALEX FAULKNER
Research associate
Department of Social Medicine,
University of Bristol,
Bristol BS8 2PR

1 Surgical innovation under scrutiny. *Lancet* 1993;342:187-8.
2 Lam CM, Murray FE, Cuschieri A. Increased cholecystectomy rate after the introduction of laparoscopic cholecystectomy in Scotland. *Gut* 1996;38:282-4.
3 Enkin M, Keirse MJMC, Renfrew M, Neilson J. Imaging ultrasound in pregnancy. In: *Guide to effective care in pregnancy and childbirth.* 2nd ed. Oxford: Oxford University Press, 1995:40-5.
4 Pegg DJ. Hip replacements come in at least 10^{11} varieties. *BMJ* 1996;312:637.
5 Advisory Council on Science and Technology. *A report on medical research and health.* London: Office of Science and Technology, 1993.
6 Department of Health. *The government s response to the ACOST report on medical research and health.* London: DoH, 1993.
7 Neuhauser D. Ernest Amory Codman, MD, and end results of medical care. *Int J Technol Assess Health Care* 1990;6:307-25.
8 Irving M. *Hunter's baton: oration delivered on the bicentenary of the death of John Hunter.* London: Royal College of Surgeons of England, 1994.