cannot be identified and high doses of oestrogen may be dangerous.

Among women with depressed mood (as against depressive disorder) oestrogen has been reported as beneficial by some investigators^{19,21} but not others.²² Overall, the evidence suggests that oestrogen may alleviate depressed mood and induce a sense of wellbeing.

Does perimenopausal depression require special treatment? If the diagnosis is depressive disorder the primary treatment is not oestrogen but standard psychiatric treatment, whether pharmacological or psychological, or both. The psychological treatment will probably be concerned with emotional reactions to the menopause or to the problems of middle life. If the patient has distressing vasomotor symptoms then oestrogen can be given as an adjunct.

If the diagnosis is solely depressed mood the treatment will depend on the cause—counselling and social measures will be appropriate for stressful events or circumstances whereas oestrogen is likely to be appropriate for patients with vasomotor symptoms.

Finally, it should be said that the menopause can mean a new lease of life to some women, bringing freedom from menstruation and child bearing. Cultural effects are likely to be important here.²³ In some societies, for example, post-menopausal women are given enhanced status.²⁴

DENNIS GATH
Clinical Reader

SUSAN ILES
Wellcome Research Fellow

University Department of Psychiatry,
Warneford Hospital,
Oxford OX3 7JX

- McKinlay S, Jeffereys M, Thompson P. An investigation of age at menopause. *J Biosoc Sci* 1972;4:161-73.
- Jones MJ, Marshall DH, Nordin BEC. Quantitation of menopausal symptomatology and its response to ethinyl oestradiol and piperazine oestrone sulphate. *Curr Med Res Opin* 1977;4(suppl 3):12-20.
- Ballinger B. Psychiatric morbidity and the menopause: survey of a gynaecological out-patient clinic. *Br J Psychiatry* 1977;131:83-9.
- Byrne P. Psychiatric morbidity in a gynaecological clinic. An epidemiological survey. *Br J Psychiatry* 1985;144:28-34.
- Mayou R, Hawton K. Psychiatric disorder in the general hospital. *Br J Psychiatry* 1986;149:172-90.
- McKinlay SM, Jeffereys M. The menopausal syndrome. *Br J Prev Soc Med* 1974;28:108-15.
- Ballinger B. Psychiatric morbidity and the menopause: screening of a general population sample. *Br Med J* 1975;iii:344-6.
- Hallstrom T, Samuelsson S. Mental health in the climacteric. The longitudinal study of women in Gothenburg. *Acta Obstet Gynecol Scand [Suppl]* 1985;130:13-8.
- Gath D, Osborn M, Bungay G, et al. Psychiatric disorder and gynaecological symptoms in middle aged women: a community survey. *Br Med J* 1987;294:213-8.
- McKinlay JB, McKinlay SM, Brambila D. The relative contributions of endocrine changes and social circumstances to depression in middle-aged women. *J Health Soc Behav* 1987;28:345-63.
- Kaufert PA, Gilbert P, Hassaret T. Researching the symptoms of menopause: an exercise in methodology. *Maturitas* 1988;10:117-31.
- Gath D, Cooper P, Bond A, Edmonds G. Hysterectomy and psychiatric disorder. II. Demographic and physical factors in relation to psychiatric outcome. *Br J Psychiatry* 1982;140:343-50.
- Greene JS, Cooke DJ. Life stress and symptoms at the climacterium. *Br J Psychiatry* 1980;136:486-91.
- Aylward M. Estrogens, plasma tryptophan levels in perimenopausal patients. In: Campbell S, ed. *The management of the menopause and post-menopausal years*. Manchester: MTP Press, 1976; 135-47.
- Coppen A, Bishop M, Beard RJ. Effects of piperazine oestrone sulphate on plasma tryptophan, oestrogen, gonadotrophins and psychological functioning in women following hysterectomy. *Curr Med Res Opin* 1977;4(suppl 3):29-36.
- Klaiber EL, Broverman DM, Vogel W, Kobayashi Y. Estrogen therapy for severe persistent depressions in women. *Arch Gen Psychiatry* 1979;36:550-4.
- Chalmers JS, Fulli-Lemaire I, Cowen PJ. Effects of the contraceptive pill on sedative responses to clonidine and dapsomorphine in normal women. *Psychol Med* 1985;15:363-7.
- Bungay GT, Vessey MP, McPherson CK. Study of symptoms in middle-life with special reference to the menopause. *Br Med J* 1980;281:181-3.
- Brincat M, Studd JWW, O'Dowd T, Magos A, Cardoza LD, Wardle PJ. Subcutaneous hormone implants for control of climacteric symptoms. *Lancet* 1984;i:16-8.
- Sherwin B, Gelfand M. Sex steroids and affect in the surgical menopause: a double-blind, cross-over study. *Psychoneuroendocrinology* 1985;10:325-35.
- Sherwin B. Affective changes with oestrogen and androgen replacement therapy in surgically menopausal women. *J Affective Disord* 1988;14:177-87.
- Iatrakis G, Haronis N, Sakellariopoulos G, Kourkabas A, Gallos M. Psychosomatic symptoms of postmenopausal women with or without hormonal treatment. *Psychother Psychosom* 1966;46:116-21.
- Beyene Y. Cultural significance and physiological manifestations of menopause. A biocultural analysis. *Cult Med Psychiatry* 1986;10:47-71.
- George T. Menopause: some interpretations of the results of a study among non-western groups. *Maturitas* 1988;10:109-16.

The empty theatre

Better use of operating theatres requires better management

Inefficient use of resources is one of the government's most publicised perceptions of the problems of the NHS, and it was the mainspring of its current plans for restructuring the service. In respect of operating theatres a report by the National Audit Office in 1987 seemed to confirm this view, claiming that 40% of operating time was unused during the working day.¹ The report did not examine the reasons for this in detail, leaving the field clear for the media to add its own interpretations. Of the various options the "missing consultant" explanation attracted the most enthusiasm.

Against that background the NHS Management Executive commissioned a thorough study of the use of operating theatres under the guidance of a steering committee chaired by Professor Peter Bevan of the Royal College of Surgeons of England. Its report was published in December 1989 after a detailed analysis of the working of the theatres in 12 hospitals.² The findings paralleled those of the National Audit Office study—namely, the rate of use of operating theatres ranged between 50% and 80% depending on the criteria. The report highlighted the myriad of predictable causes, primarily shortages—shortage of beds, shortage of staff, and shortage of other resources. Additionally it spelled out firmly and with detail a potentially more remedial cause: undermanagement. Planned theatre sessions cost approximately £150 an hour to run, and failure to use planned sessions represents a substantial waste of money—probably in excess of £150m a year.

Other features that confounded attempts at efficient use were late starting (32% of lists), late finishing (20%), and both (9%).

The report is being presented at the Healthcare Exhibition at the National Exhibition Centre (22-24 May), where it will be discussed by an audience drawn from all of the health professions. They will be told that the report clearly identified a need for firm management as the way to solve the problems. In doing so its authors were at pains to point out that managers will need primarily to have managerial skills and should not be appointed solely on the basis of their professional background. The unspoken rider to this was that there is no reason why theatre managers should be drawn from the nursing hierarchy.

One of the first tasks for the theatre managers will be to break down the notion that a theatre is the fiefdom of the consultant who uses it, underuses it, overuses it, or abuses it at will. To assist the transfer of managerial control the new manager will need to be backed up by two resources: good information and clinical muscle. Accurate and timely information on theatre usage, case duration, staff availability, and so on, will be needed, and the complexity of those data is such that relatively advanced computer systems will need to be installed. The strong clinical support might come, the Bevan report suggested, from the somewhat old fashioned concept of a theatre users' committee; a more modern view of manage-

ment techniques suggests that a clinical director drawn from the ranks of the surgeons or anaesthetists might provide more direct and effective support. For the foreseeable future the most intransigent problem that the new managers will face, however, will be shortage of staff. This report properly pointed out that operation department assistants and nurses should be interchangeable, as should theatre and anaesthetic work—and that with parity of work should come parity of pay.

The problems of operating theatres are neatly quantifiable and thus may be soluble; but theatres and beds are almost totally interdependent, and if the problems of providing beds are not solved reforms in the theatre suite will be wasted. Ensuring a steady flow of patients is a much more taxing problem than improving the usage of theatres, and it depends on factors such as waiting lists, admissions, case mix, and staffing. The Bevan report made a stab at suggesting some

solutions, including more computerisation and more day case surgery. The possibility that overall there might not be enough surgical beds in the NHS at present was not addressed.

Operating theatres—like the whole of the NHS after the white paper—will need to be heavily managed. Whether history will show that the huge injection of cash, technology, human effort, and angst will be worth while in clinical, financial, and human terms remains to be seen.

ANTHONY YOUNG

Consultant Surgeon,
St Thomas's Hospital,
London SE1 7EH

1 National Audit Office. *The use of operating theatres in the National Health Service, report by the Comptroller and Auditor General*. London: HMSO, 1987.

2 NHS Management Executive. *The management and utilisation of operating departments*. London: HMSO, 1989. (Chairman P G Bevan.)

The penicillins today

Use is now well defined by clinical trials

Pneumococci, streptococci, gonococci, and meningococci have been the major targets for penicillin for half a century. Resistance has long excluded *Staphylococcus aureus* from this list of pyogenic cocci with predictable susceptibility to penicillin. The extent of penicillin resistance in gonococci reached a peak in 1983 and has since declined.¹ Pneumococci are still generally susceptible, despite the worrying identification of strains with either reduced susceptibility (minimum inhibitory concentration $>0.1-2$ mg/l), or, less common still, overt resistance (minimum inhibitory concentration >2 mg/l).² The highest incidence of these resistant pneumococci is in the Iberian peninsula—a popular holiday destination for many Britons.³ Penicillin resistance among meningococci has been identified in Spain, South Africa, and Britain.⁴⁻⁶

Despite these concerns the indications for penicillin G remain infections caused by pneumococci, meningococci, *Streptococcus pyogenes* and other non-enterococcal streptococci, microaerophilic streptococci such as *Streptococcus milleri*, and gonorrhoea when susceptibility can be confirmed. The continued susceptibility of *Treponema pallidum* is reassuring, though when syphilis complicates HIV infection more prolonged treatment is necessary.⁷ Acute leptospirosis⁸ and established Lyme borreliosis⁹ are other indications. Most oral and anaerobic bacteria, including both the actinomycetes and the clostridia, remain susceptible to penicillin.¹⁰

The isolation of the 6-aminopenicillanic acid nucleus in 1957 was an important milestone in the development of the penicillins. The first fruit of this discovery was ampicillin. Other aminopenicillins, analogues, esters, and prodrugs followed: amoxycillin, pivampicillin, bacampicillin, and talampicillin to name but a few. The extensive indications for the aminopenicillins include infections of the middle ear, paranasal sinuses, and lower respiratory tract; meningitis caused by meningococci, pneumococci, *Haemophilus influenzae*, susceptible Gram negative enteric bacilli, *Strep agalactiae*, and *Listeria monocytogenes*; systemic salmonellosis, including enteric fever; and serious enterococcal sepsis and urinary tract infections. Despite their established safety, including for use in pregnancy, drug resistance has relegated the aminopenicillins to second line treatment for urinary tract

infections, and the increase in the number of strains of *H influenzae* and *Branhamella catarrhalis* producing β -lactamase raises questions concerning the continuing efficacy of these drugs to treat such infections.

The discovery that resistance to penicillin is caused by enzymatic hydrolysis of the β -lactam ring by *Staph aureus* stimulated the development of the penicillinase-resistant penicillins such as methicillin, nafcillin, and the isoxazolyl penicillins—oxacillin, cloxacillin, dicloxacillin, and flucloxacillin. These compounds are the mainstay of antistaphylococcal treatment, with flucloxacillin popular in Europe and nafcillin, oxacillin, and dicloxacillin in North America. These have generally been assumed to be of comparable clinical efficacy. Recent experimental data suggest, however, that dicloxacillin and (especially) methicillin are more stable to *Staph aureus* β -lactamase.¹¹ Strains of *Staph aureus* with reduced affinity of the binding protein 2' are resistant to these and all other penicillins.¹² And coagulase negative staphylococci, which are now a major cause of hospital sepsis, are also often resistant to these penicillins.¹³

Penicillinase is one of a large and expanding family of β -lactamases that has eroded the therapeutic efficacy of the penicillins.¹⁴ Resistance is now recognised in about 40% of *Escherichia coli*,¹⁵ 6% of *H influenzae* (8% among type b isolates),¹⁶ some 5% of gonococci,¹ and up to 70% of *B catarrhalis*,¹⁷ while *Staph aureus* that are sensitive to penicillin are collectors' items. Recognition that antistaphylococcal penicillins such as cloxacillin and bind penicillinase suggested a chemotherapeutic solution to the protection of the β -lactam ring, and this has been realised in β -lactamase inhibitors such as clavulanic acid, sulbactam, and tazobactam. While lacking useful antibacterial activity they confer broad spectrum, yet individually variable, resistance to Gram negative β -lactamases.¹⁸ Where resistance is the result of impaired cell wall penetration, however, these β -lactamase inhibitors are of no therapeutic benefit. Clavulanate is licensed in combination with both an aminopenicillin, co-amoxiclav (augmentin), and ticarcillin. Sulbactam is licensed in other countries as the mutual prodrug sultamicillin. Co-amoxiclav is available in a fixed ratio of amoxycillin and clavulanate of 2:1 for oral administration and as a 5:1 ratio for parenteral use; ticarcillin-