is usually taken because the patient is violent, unresponsive to standard treatment, and is hazarding the safety of the ward environment. A senior nurse normally makes the initial decision to begin seclusion and a doctor makes an assessment later. Typically, secluded patients have schizophrenia or mania: other diagnoses are less frequent. As a group secluded patients are significantly younger and stay in hospital longer than non-secluded patients.¹⁶⁻¹⁸ There are few other differences between the two groups.

The use of seclusion in practice is described in a report from a 25 bed long stay British ward for disturbed and aggressive women.¹⁹ In a year there were 69 episodes of seclusion, affecting 15 patients. In half of the incidents seclusion lasted for less than an hour; the average duration was two and a half hours and the longest period 23 hours. Peak occasions for seclusion were mealtimes and days when there was a change of nursing shifts. About half the patients were settled or asleep while in seclusion, but the rest kept up a disturbance. In a quarter of the episodes patients continued to be disruptive after seclusion; nevertheless, generally seclusion was succeeded by quiet behaviour.

There is probably some truth in the belief that seclusion secures "an irritable brain from causes of increased irritability."²⁰ Nevertheless, its benefits, when they occur, are more likely to be due to appropriate medication and attention from staff. Moreover, like many medical interventions, seclusion may also have adverse effects. In one study of 63 patients such difficulties were noted in 30 cases¹⁸: 19 patients assaulted staff; eight deliberately injured themselves; four destroyed the room; in four the mental state deteriorated; and three patients deteriorated physically because of unrecognised organic conditions. Finally, in no fewer than 16 of the 63 cases few or no medical records were kept of the seclusion.

As a minimum safeguard hospitals should always have strict regulations about the use of seclusion; these should include the requirement that secluded patients are visited routinely and often by medical and nursing staff. Each of the special hospitals has an established procedure for using and recording seclusion, and similar arrangements apply in mental hospitals.¹¹⁻²¹⁻²² None the less, both in Parliament and in the National Health Service concern is still being expressed about the use of seclusion.²² Perhaps this concern should also be linked to recognising that the National Health Service has to find ways of treating more of its disruptive and aggressive patients without resorting to bans on admission or relying on the prison service.²³⁻²⁴ Finally, because an excessive use of seclusion may, say, be a consequence of a shortage of nursing staff,⁴⁻¹² or of a failure to consider other forms of psychiatric treatment, I welcome that the commission considering the new Mental Health Act is expected to take a close interest in it.²²

GREG WILKINSON

Senior Registrar,
Maudsley Hospital,
London SE5 8AZ
(now Research Psychiatrist,
MRC Unit for Epidemiological
Studies in Psychiatry,
University Department of Psychiatry,
Royal Edinburgh Hospital,
Edinburgh EH10 5HF)

¹ Public Policy Committee of the Royal College of Psychiatrists. Locked wards and informal patients. *Bulletin of the Royal College of Psychiatrists* 1980;Jan:8-9.

² Royal College of Psychiatrists. Isolation of patients in protected rooms during psychiatric treatment. *Bulletin of the Royal College of Psychiatrists* 1981;5:96.

- ³ Anonymous. Locking up patients by themselves. *Bulletin of the Royal College of Psychiatrists* 1982;6:199-200.
- ⁴ Royal College of Nursing: Society of Psychiatric Nursing. *Seclusion and restraint in hospitals and units for the mentally disordered*. London: Royal College of Nursing of the United Kingdom, 1979.
- ⁵ Strutt R, Bailey C, Peermohamed R, Forrest AJ, Corton B. Seclusion: can it be justified? *Nursing Times* 1980;76:1629-33.
- ⁶ Higgins J. Four years' experience of an interim secure unit. *Br Med J* 1981;282:889-93.
- ⁷ Department of Health and Social Security. *Report of the review of Rampton Hospital*. London: HMSO, 1980.
- ⁸ Royal College of Psychiatrists, Royal College of Nursing, and the British Psychological Society. *Behaviour modification*. London: HMSO, 1980.
- ⁹ Department of Health and Social Security. *The management of violent, or potentially violent, hospital patients*. London: DHSS, 1976. (HC(76)11.)
- ¹⁰ Confederation of Health Service Employees. *The management of violent or potentially violent patients*. Banstead: Confederation of Health Service Employees, 1977.
- ¹¹ Young G. Parliamentary written reply. *House of Commons official report (Hansard)* 1980 Jan 25-31;977:cols 257-9. (No 1158.)
- ¹² Department of Health and Social Security. *Report of the committee of inquiry into Normansfield Hospital*. London: HMSO, 1978.
- ¹³ Royal College of Psychiatrists. The Normansfield Hospital inquiry. *Bulletin of the Royal College of Psychiatrists* 1979;Oct:146-7.
- ¹⁴ Gutheil TG. Observations on the theoretical bases for seclusion of the psychiatric inpatient. *Am J Psychiatry* 1978;135:325-8.
- ¹⁵ Gutheil TG. Restraint versus treatment: seclusion as discussed in the Boston state hospital case. *Am J Psychiatry* 1980;137:718-9.
- ¹⁶ Plutchik R, Karasu TB, Conte HR, Siegel B, Jerrett I. Toward a rationale for the seclusion process. *J Nerv Ment Dis* 1978;166:571-9.
- ¹⁷ Wells DA. The use of seclusion on a university hospital psychiatric floor. *Arch Gen Psychiatry* 1972;26:410-3.
- ¹⁸ Mattson MR, Sacks MH. Seclusion: uses and complications. *Am J Psychiatry* 1978;135:1210-3.
- ¹⁹ Campbell W, Shepherd H, Falconer F. The use of seclusion. *Nursing Times* 1982;78:1821-5.
- ²⁰ Conolly J. *Treatment of the insane without mechanical restraints* (1856). Reprinted, and introduced by Hunter R, Macalpine I. Folkestone and London: Dawsons of Pall Mall, 1973.
- ²¹ The Bethlem Royal Hospital and the Maudsley Hospital. *Procedure for the seclusion of patients in the joint hospital*. London: The Bethlem Royal Hospital and the Maudsley Hospital House Governor's Office, 1982.
- ²² Davis T. Parliamentary written reply. *House of Commons official report (Hansard)* 1982 Dec 6;33:col 398. (No 24.)
- ²³ Buglass R. Regional secure units and interim security for psychiatric patients. *Br Med J* 1978;i:489-93.
- ²⁴ Orr JH. The imprisonment of mentally disordered offenders. *Br J Psychiatry* 1978;133:194-9.

Double indemnity in oesophageal carcinoma?

Oesophagectomy for cancer has a mortality reaching 30% in some series—the highest mortality of any routinely performed operation.¹ Incomplete excision of the tumour and its microscopic local extensions exposes the patient to this high operative risk for little benefit; for if he survives long enough he will develop a recurrence of malignant dysphagia. The longitudinal extent of spread of oesophageal squamous carcinoma has been well studied, and skip lesions occur at a distance from the main tumour.² Histological examination of frozen sections has been advocated during surgical resection to determine if the cut ends are clear of tumour,³⁻⁴ but the histologist cannot examine the whole oesophageal circumference within a reasonable time limit, and he may miss small skip lesions. A minimum clearance of 12 cm from macroscopically detectable growth was advocated 20 years ago.⁵ Nevertheless, one quarter of all resections are still thought to be incomplete.⁶

Several authors have emphasised the extraoesophageal spread of carcinoma as seen in operation specimens² and at necropsy.⁷ Logan in Edinburgh attempted the first radical resections with block dissection of the adjacent connective tissues and lymph nodes.⁸ Radiological studies have shown,

however, that the lymphatic drainage of the oesophagus is not segmental, and regardless of the level of the primary tumour metastatic deposits may be found in lymph nodes anywhere between the external jugular vein and the coeliac axis.⁹ The frequency of this extensive spread has been shown in recent reports from Japan. At operation the extent of spread to the lymph nodes has been assessed in relation to the level of the primary tumour within the thorax. In one series of 354 patients,¹⁰ almost one-third of those with tumours in the upper or middle third of the oesophagus had spread to the nodes of the upper stomach, while two-thirds of patients with tumours in the lower third had spread to those nodes, 21% had spread to the coeliac nodes, 15% to the splenic nodes, and 10% to the common hepatic artery nodes. Even more disturbing is a report on 36 patients in whom extensive nodal curettings were carried out at operation.¹¹ Ten of the 36 had "jumping" metastases to nodes in the neck or abdomen with no intra-thoracic metastases. Regardless of the level of the primary tumour left supraclavicular nodes were affected in seven patients and, surprisingly, right supraclavicular nodes were affected in nine.

A surgeon contemplating resection for oesophageal carcinoma must therefore decide whether he can indemnify the patient against recurrence at the anastomosis and also against recrudescence elsewhere. Recurrent malignant dysphagia may be prevented by resecting at least 12 cm on either side of visible tumour—even though this may demand resecting most or all of the stomach and most or all of the thoracic oesophagus for tumours at or near the gastric cardia.¹² Continuity should be restored by leading the jejunal or colonic conduit as far as possible from the oesophageal bed—which may still harbour microscopic residual tumour that might later invade and obstruct the conduit. Wide bypass without resection is infinitely preferable to inadequate resection, and the operative mortality is much lower.

The patient cannot be indemnified against recurrent tumour at sites other than the anastomosis. Even if the supraclavicular, mediastinal, coeliac, splenic, hepatic, and gastric lymph nodes were routinely dissected bloodborne metastases may already be present. Roberts recently recommended that mediastinal and abdominal node biopsy should be performed before submitting patients to radical resection.¹³ In view of the reported high incidence of spread to the supraclavicular nodes biopsy should be considered before even opening the abdomen or chest—since they are not routinely irradiated in radiotherapy for squamous carcinoma of the oesophagus. If these nodes are affected resection is valueless.

R M KIRK

Consultant Surgeon,
Royal Free Hospital,
London NW3 2QG

¹ Earlam R, Cunha-Melo JR. Oesophageal squamous cell carcinoma. I. A critical review of surgery. *Br J Surg* 1980;**67**:381-90.

² Morson B. The spread of carcinoma of the oesophagus. In: Smithers DW, Tanner NC, eds. *Tumours of the oesophagus*. Edinburgh: E & S Livingstone, 1961:136-45.

³ Pack GT, McNeer G. Surgical treatment of cancers of the gastric cardia. *Surgery* 1948;**23**:976-1019.

⁴ Keighley MRB, Moore J, Lee JR, Malins D, Thompson H. Peroperative frozen section and cytology to assess proximal invasion in gastro-oesophageal carcinoma. *Br J Surg* 1981;**68**:73-4.

⁵ Miller C. Carcinoma of thoracic oesophagus and cardia. A review of 405 cases. *Br J Surg* 1962;**49**:507-22.

⁶ Appelquist P. Carcinoma of the oesophagus and gastric cardia. A retrospective study based on statistical and clinical material from Finland. *Acta Chir Scand* 1972;suppl 430:1-92.

⁷ Postlethwait RW, Sealy WC. *Surgery of the esophagus*. Springfield, Illinois: Thomas, 1961.

⁸ Logan A. The surgical treatment of carcinoma of the esophagus and cardia. *J Thorac Cardiovasc Surg* 1963;**46**:150-61.

⁹ McCort JJ. Radiographic identification of lymph node metastases from carcinoma of the esophagus. *Radiology* 1952;**59**:694-711.

¹⁰ Akiyama H, Tsurumaru M, Kawamura T, Ono Y. Principles of surgical treatment of carcinoma of the esophagus. Analysis of lymph node involvement. *Ann Surg* 1981;**194**:438-46.

¹¹ Sannohe Y, Hiratsuka R, Doki K. Lymph node metastases in cancer of the thoracic esophagus. *Am J Surg* 1981;**141**:216-8.

¹² Kirk RM. A trial of total gastrectomy, combined with total thoracic oesophagectomy without formal thoracotomy, for carcinoma at or near the cardia of the stomach. *Br J Surg* 1981;**68**:577-9.

¹³ Roberts JG. Cancer of the oesophagus—how should tumour biology affect treatment? *Br J Surg* 1980;**67**:791-7.

Ampicillin and alternatives

Since its introduction in 1961 ampicillin has become the antibiotic of choice for the treatment of many infections, as the recommendations in the *British National Formulary* indicate.¹ It is widely prescribed and in a recent survey in a district general hospital 41% of all antibiotic prescriptions were for ampicillin.²

Various esters of ampicillin (pivampicillin, bacampicillin, and talampicillin) and related compounds or ampicillin analogues (ciclacillin, epicillin, and amoxycillin) have been developed, but do these other agents have any real advantages over ampicillin? These three esters are hydrolysed to ampicillin after absorption from the gut so that antibacterial activity is identical with that of ampicillin. Epicillin (not available in Britain) is an antibacterial agent in its own right, but its spectrum and activity are similar to those of ampicillin.³ At best the in vitro activity of ciclacillin is only one quarter that of ampicillin and it performs badly against some Gram negative species.⁴ It is more resistant to the effects of staphylococcal β -lactamase than ampicillin but a study in volunteers suggested that there was little difference between the activities of the two drugs in vivo.⁵ Amoxycillin also has a spectrum of activity similar to that of ampicillin, but reports of its use in Gram negative infections in mice suggest that it may be more effective in vivo.⁶⁻⁸ Ampicillin and amoxycillin were given in doses to achieve equal serum concentrations. Although the minimum inhibitory concentrations of the two agents were the same, amoxycillin had a greater protective effect as judged by reduction in size of the infective lesion, number of viable organisms obtained from the lesion,⁷ and survival of the animals.⁶ In contrast with this work recent studies^{9,10} suggest that some Enterobacteriaceae are susceptible to ampicillin but resistant to amoxycillin.

Despite the similarity in their activity the antibacterial agents vary in their pharmacokinetics. Ampicillin is only moderately well absorbed from the gut (about 40% is recovered in the urine). The esters and related compounds are more completely absorbed. Equal oral doses of amoxycillin and ampicillin achieve serum concentrations at a ratio of 2:1,^{11,12} and the urinary concentration of amoxycillin is higher. Bacampicillin and talampicillin have similar absorption characteristics to amoxycillin.^{13,14} Verbist¹⁵ reported that pivampicillin was better absorbed than amoxycillin, while other authors consider that its absorption is between that of amoxycillin and ampicillin.¹⁶ Peak serum concentrations of ciclacillin are thought to be five times higher than those of ampicillin after equal doses, but the excretion of ciclacillin is fast and the concentrations fall rapidly.¹⁷ The enhanced absorption of amoxycillin, talampicillin, bacampicillin, and pivampicillin means that they may be given less often than