The current year, 1990-1, is the last of the prereformation era of the NHS—and by all accounts it will prove to be one of the most financially difficult. Despite securing over 40% of the total increase in public spending for 1990-1, nine out of 10 health authorities say that this year will be difficult or very difficult financially. A quarter state that they will be making service reductions, and nearly six out of 10 reckon that they will be worse off than they were in 1987-8—the year when over £100m was provided to rescue health authorities from financial difficulties (BBC social affairs unit, personal communication). Over a third of health authorities say that they will not be able to devote any money to service developments, and the total amount of money set aside for developments in 1990-1 (£111m) is half that spent in 1989-90. The problem for Kenneth Clarke over health service funding is that no matter how he looks around there is no winning solution. Overspent health authorities are a political embarrassment, raising allegations of underfunding (and counter allegations of poor financial management). But equally if health authorities stay within budget the price of doing so is inevitably cuts in services, reductions in developments, fewer patients treated, longer waiting lists, and an increasing proportion of health needs left unmet. Though there may be no neat solution to the problem of health service funding, the right to set budgets carries with it the equal responsibility for the ensuing consequences. JOHN APPLEBY

Mitracheteotomy

A new, simple technique for treating patients with retention of sputum

Promotion of coughing is important in treating patients with retention of sputum. It needs to be combined with adequate rehydration, humidification of the airways, physiotherapy, and postural drainage. Various maneuvers have been tried to encourage coughing, the simplest being to use pharyngeal suction, often through a nasopharyngeal airway; this can be effective—if unpleasant. Techniques also described include intratracheal placement of suction catheters, the instillation of saline through the cricothyroid membrane, intermittent endotracheal intubation, and bronchoscopy. These represent an increasingly aggresssive continuum of intervention, likely to need repetition. When they fail the last resort is tracheotomy.

A recent innovation in these circumstances is mitracheteotomy, in which a vertical slab incision is made in the cricothyroid membrane under local anaesthesia, allowing placement of a 4 mm cannula. This provides ready access for repeated suction and delivery of oxygen. It has the attraction of being a simple procedure in experienced hands, it is comfortable for the patient, and he or she retains speech and the ability to eat. It needs sensible monitoring by nurses—for if the suction port is left open secretions will spill on to the chest and oxygen tensions may fall owing to redirected ventilation.

Matthews and Hopkinson described 24 patients (15 who had had thoracotomy and nine medical patients) in whom retention of sputum was a major problem, and in 19 emergency treatment was needed for respiratory distress. Ten of these had been treated with intermittent intubation or bronchoscopy. Percutaneous insertion of a mitracheteotomy tube was successful in 23, while in the one remaining patient insertion was undertaken under direct vision as the cricothyroid membrane was calcified. Cannulation lasted between one and 10 days in most patients, but in two patients treatment continued for 35 and 45 days. Two patients required a change of tube. In only one case was the mitracheteotomy considered unsatisfactory. Removing the cannula was uneventful and all wounds had healed, without any sequel, in six days.

Pederson et al independently assessed the role of mitracheteotomy in 15 patients with retention of sputum postoperatively. Thirteen were successfully treated, while the other two deteriorated and required ventilation—but both had mitracheteotomy tubes reinserted after extubation. One patient had bleeding, which was controlled by external pressure for 15 minutes, and one developed subcutaneous and mediastinal emphysema related to violent coughing. The duration of the cannulation ranged from four to 38 days, and the wound had healed in all patients within three days of removal of the tube.

The prime indication for mitracheteotomy is to remove chest secretions, but it has also been used in the treatment of respiratory failure with a high frequency jet ventilator, in obstructive sleep apnoea, and to manage retention of sputum in the older child (a paediatric version is not available), and it has been described as a preliminary step (as an alternative to tracheotomy) in the management of an obstructed airway before laryngectomy.

Nevertheless, some caution is needed. There have been complications at the time of insertion, and it is very important that the patient is correctly positioned as for a tracheotomy to ensure that the anatomical structures are well displayed and readily palpable. The operator stands at the head of the patient, who may find this disconcerting. A confused, possibly hypoxic patient may not easily tolerate lying still or still for the procedure. The initial version of the mitracheteotomy device lacked a flange, so that the cannula could be inhaled.

Misplacement into the mediastinum in mistake for the trachea has been reported; displacement from the larynx during high frequency ventilation has led to emphysema and respiratory distress. Surgical emphysema has also occurred in unventilated patients, perhaps owing to a combination of the incision being made larger than the size of the cannula and a coughing bout. Intraseosophageal placement has also been reported.

At the time of insertion there is always some venous bleeding from the stab site, but this resolves with pressure. Severe bleeding may occur and require surgical intervention. A recent example of life threatening bleeding occurred in a patient who was taking anticoagulants and who had a subglottic polypl. Individual case reports have not given any indication of the frequency of complications, which tend to be reported only if dramatic. Many of the practical complications reflect technical problems at the time.
Antibodies are back in the news again with a report that genetically engineered fragments of an antibody molecule have many of the properties of specificity and binding of more complete immunoglobulin chains. Dogma had it that antigen recognition and binding depend on the presence of segments or domains of both light and heavy chains; or at least their terminal domains. These were the segments with the variability in amino acid sequences that gave each antibody its unique specificity for one particular antigen. Now a group of workers in the Medical Research Council Molecular Biology Laboratory at Cambridge have shown that single domains are sufficient to ensure specific binding—albeit at rather lower affinities than those observed when both light and heavy chain domains are present.

The commentary in Nature on the implications of this exciting discovery made the point that this time the Medical Research Council has tied up the patient, avoiding the expensive mistake made by the National Research and Development Council in the late 1970s when Kohler and Milstein first discovered the technique for making monoclonal antibodies in the test tube. This replaced the tedious and unreliable animal immunisation methods previously used, but the council decided then that there were “no immediate practical implications of commercial value.”

In fact, the discovery by Kohler and Milstein was undoubtedly one of the most useful advances in immunology in the past 10 years, and commercial firms have not been slow to exploit it. The method produces monoclonal antibodies in tissue culture (that is, antibodies that are effectively the product of a line or clone of identical cells) by using hybrids that are the fusion product of immortal mouse myeloma cells and splenic B lymphocytes. The lymphocytes contain all the necessary genetic information needed to programme the myeloma cells to produce unending quantities of specific antibody in continuous culture in vivo or in vitro with inbred strains of mice as the source of cells. Within months every scientist who wanted to use antibodies was beavering away making hybridomas and selecting antibodies for the task in hand. Endless possibilities were envisaged for the application of such reagents in diagnosis—both in the laboratory and as tools for imaging tumours and other deep seated lesions—and for treatment either alone— for example, to remove excess digoxin—or coupled to bacterial or plant toxins to target their toxic effects on specific cells in tumours or in the marrow.

Many diagnostic test kits were soon designed that used monoclonal antibodies, but the therapeutic and in vivo diagnostic uses were not so successful. The snags became obvious only with time: the need for expensive large volume tissue cultures to produce the quantities required, the chance that the chosen hybrid might shed the necessary chromosomes for immunoglobulin production, the problems of using mouse immunoglobulin in humans (where it is treated as a