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Pseudolipoma of Breast: Mr. H. S. Shucksmith and Dr. J. A. Dossett draw attention to its frequent association with cancer (p. 1459).

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Anaesthetist's Role in Early Management of Head Injuries

Of all deaths on the road 60% result from injury to the head[1]; among motor-cyclists the figure is 80–90%. As about 100,000 patients with head injury are admitted to hospital in Great Britain every year (270 every day), it is surprising that in many areas there is no clear plan for the efficient emergency treatment of these patients. Some advice for the individual doctor is provided by Mr. John M. Potter in the "Current Practice" section of the *B.M.J.* this week (page 1477).

In considering the management of the respiratory system the patient unconscious as a result of a head injury may be likened to the patient unconscious during anaesthesia,[2] and the anaesthetist's role in the early treatment of these injuries is important.[3,4] Whatever else is done for a patient with a head injury, the immediate need is to establish a clear airway and adequate respiration. To a brain already injured any additional hypoxia or hypercarbia resulting from obstruction of the airway will have more severe effects than in an otherwise healthy subject.[5,6] Even the assessment of the level of unconsciousness, important as it is in the diagnosis and treatment, must take second place if the airway is not clear; the restoration of a free airway and adequate oxygenation in a patient with respiratory obstruction or insufficiency often leads to a dramatic lightening of the level of consciousness.

Respiratory obstruction is the result of the tongue blocking the airway or of the aspiration of foreign material (blood, cerebrospinal fluid, or vomit) into the lungs. For both these reasons the patient should be nursed, if at all possible, in the semi-prone position. If the patient is deeply unconscious, endotracheal intubation with a cuffed tube may be urgently needed and is usually easy to carry out.[3,4] Endotracheal intubation may also be necessary for patients whose level of consciousness is much lighter. However, patients with a full stomach—and surely these patients must all be regarded as having full stomachs—may be difficult to intubate.[4] In these cases, in which there is a risk of regurgitation, S. M. Hart[4] favours the passage of a wide-bore oesophageal tube, and stresses the dangers of the use of relaxants or chlorpromazine to facilitate endotracheal intubation. Tracheostomy has frequently been performed in recent years on patients unconscious as a result of head injuries, and the operation is recommended if, after 24 hours of endotracheal intubation, the patient's condition has not improved sufficiently to allow the tube to be removed altogether.[4] The patient with a head injury who also has chronic bronchitis or an associated chest infection should certainly have tracheostomy carried out on him early, but there is a tendency to-day to employ endotracheal intubation for longer periods than formerly, provided the tube can be easily changed at least once every 24 hours and the standard of supervision and nursing care is high.[7]

With an endotracheal or tracheostomy tube in place the ventilation may have to be assisted or controlled. Apnoea or severe respiratory insufficiency may be due to permanent damage to the respiratory centre, but it is often difficult to make this diagnosis in the early stages, and controlled ventilation must be instituted until the patient's condition can be more clearly assessed. Another group of patients who may require controlled ventilation are those injured elsewhere in addition to the head; 30% of all head injuries are accompanied by injury to other parts of the body,[1] and, if the associated injury is to the chest, controlled ventilation may be life-saving.[8] The possibility of a chest injury should be considered if, in spite of a clear airway, the patient does not remain well oxygenated.[9] In many patients respiratory insufficiency may be less obvious, and it can then be assessed only by the repeated analysis of samples of arterial blood for oxygen and carbon-dioxide tensions and for acid-base balance. These analyses are also important for the proper control of patients who are being artificially ventilated for long periods. Most hospitals to-day have facilities for measuring carbon-dioxide tension and acid-base balance, but there are still not enough where oxygen tension can be measured. It is to be hoped that all centres dealing with head injuries will soon be able to provide this service. There is still some doubt about the value of humidifying the inspired air for a patient who has been intubated or has had a tracheostomy, but the modern multiple-gauze condenser-humidifier[10] is simple, and since it hardly does any more than take the place of the patient's own upper airway as a humidifier its more widespread use could do little harm and might be beneficial.

Induced hypothermia, with the body temperature lowered to about 33° C. (91° F.), is still sometimes used in the treatment of head injuries, and the anaesthetist, with his specialized knowledge of the procedure, is often called to control the cooling. However, opinion is still divided on the value of induced hypothermia in these cases[5 11]; moreover, it is time-consuming and has some disadvantages and complications of its own.[12] Even those workers who still favour its use accept that hypothermia is of value only if the temperature is lowered within one to two hours after the injury.[11] Here a clear distinction must be made between the artificial reduction of body temperature to 33° C. (the value of which is doubtful in the treatment of head injuries) and the artificial reduction, by the same means, of the body temperature to a normal level in a patient who has hyperpyrexia as a result of injury to the brain stem: the value of this procedure is without doubt. Confusion will continue so long as the word hypothermia is applied to both these entirely different principles of management.[1]

Less than 10% of all patients admitted with head injury require major surgical operation, and many of those with even severe trauma show signs of improvement within a few hours. Many patients who die in hospital after a severe head injury do so as a result of the complications of unconsciousness itself rather than directly from brain damage, intracranial haemorrhage, or sepsis.[5 13 14] It is within these first few hours that the anaesthetist can apply his special skill and knowledge to the care of these patients. His place in the head-injury team is clear; and it is essential, if the respiratory and other difficulties in the period immediately following the injury are to be overcome, that the anaesthetist be consulted early. He can then do much to increase the patient's chances of full recovery. As J. M. Potter[14] has said, "Relatively few head injuries prove to be serious, yet most of us learn sooner or later, that all must be treated seriously if the survival rate is to be maximal."

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[3] Matheson, J. G., Thomson, C. W., and Whitby, J. D., *Anaesthesia*, 1959, **14**, 168.
[4] Hart, S. M., *Brit. J. Anaesth.*, 1965, **37**, 189.
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[6] Hunter, A. R., *Postgrad. med. J.*, 1960, **36**, 370.
[7] McDonald, I. H., and Stocks, J. G., *Brit. J. Anaesth.*, 1965, **37**, 161.
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[9] Lewin, W., *Proc. roy. Soc. Med.*, 1961, **54**, 361.
[10] Mapleson, W. W., Morgan, J. G., and Hillard, E. K., *Brit. med. J.*, 1963, **1**, 300.
[11] Rosomoff, H. L., *Brit. J. Anaesth.*, 1965, **37**, 246.
[12] Cooper, K. E., and Ross, D. N., *Hypothermia in Surgical Practice*. London. 1960.
[13] Potter, J. M., *The Practical Management of Head Injuries*, p. 29. London. 1961.
[14] —— *Proc. roy. Soc. Med.*, 1963, **56**, 824.

Molecular Biology

To show familiarity with the work of the molecular biologists it is no longer enough for the outsider to remember which glutamic-acid residue has given way to valine in haemoglobin S, or to understand what is meant by a degenerate code. But if the access of new knowledge in the last 10 years has inevitably robbed molecular biology of some of the initial simplicity of its discoveries, this is a price we must gladly pay. In return we have a number of substantial gains. The genetic code has been broken far sooner than seemed probable when its general nature was first appreciated; our knowledge of protein synthesis is gaining rapidly in precision; and from Jacob and Monod's work on the control of gene action, for which they recently gained a Nobel prize in association with Lwoff,[1] have come our first hopes of bringing the study of developmental biology into the molecular fold.

By and large the prophets have proved extraordinarily reliable, even if one allows for the natural tendency of error to be forgotten. From the early confidence of the crystallographers in the 1930s that the biological macro-molecules could be conquered—described in Snow's *The Search*—to the first statement of the type "D.N.A. makes R.N.A. makes protein" the success rate of the predictions made must be the envy of biologists of other kinds. Dr. F. H. C. Crick, F.R.S., in introducing the latest issue of the *British Medical Bulletin*,[2] devoted to molecular biology, is cautious in predicting particular clinical applications of the new knowledge, but he is surely right in implying that we have no real choice but to seek understanding of the processes governing disease at the molecular level.

How we define molecular biology and its relationship to other branches of science matters little. Biochemistry could claim all of it; yet biophysics has provided techniques, genetics and microbiology the material. If these have been the contributors, cell physiology has so far been the major beneficiary. Clinical medicine has yet to be much involved in all this, though the abnormal human haemoglobins have a place in the history of molecular biology, and the crucial discovery of bacterial transformation by D.N.A. was the outcome of a clinically inspired curiosity about the changes bacteria may undergo during infection. This was when F. Griffith[3] showed experimentally that one antigenic type of pneumococcus could be transformed into another.

[1] *Brit. med. J.*, 1965, **2**,
[2] *Brit. med. Bull.*, 1965, **21**, 183–278.
[3] Griffith, F., *J. Hyg. (Lond.)*, 1928, **27**, 113.