

# Trauma centres

There is general agreement that trauma care in the UK should be improved and the present arguments are concerned solely with how this may be achieved. In 1988 the Royal College of Surgeons of England Working Party reported on the management of patients with major injuries and recommended setting up 25 trauma centres in the UK, one for each 2 million population and staffed by 24-h consultant cover<sup>1</sup>. A first step forward was the introduction of the American Advanced Trauma Life Support courses by the College for improving the training of doctors in trauma care<sup>2</sup>. In 1992 the Department of Health identified accident treatment as one of the six priorities for healthcare in the future. Financial support was given by the Department for four centres – Stoke-on-Trent, Hull, Preston and the Royal London Hospital – with subsequent evaluation of different aspects of their trauma systems. These have become *de facto* trauma centres, but that does not exclude other hospitals performing the same function. The subject of this article is trauma centres as recommended by the Royal College, but it must be emphasized that complete trauma care consists of prevention, treatment and rehabilitation; a total system is required. Treatment consists of prehospital care (depending on trained personnel as well as transport and communication) and care in hospital (depending on emergency room staff, theatres, intensive care units and all the professional personnel in the hospital). Trauma care does not belong to any one person or department.

Before the Working Party report, a study of 1000 deaths from trauma showed large and unacceptable variation in results between centres<sup>3</sup>. The 1000 patients were divided into half who died before reaching hospital and half who died from possibly avoidable causes in hospital. Prehospital deaths that were avoidable by better care at the scene were not studied, but the large number that occurred at the accident scene emphasized the importance of the ambulance service, its trained personnel, its communication system and its transport. Improvement in trauma care must include a closer integration of prehospital and hospital services.

The original plan for the 192 districts in England and Wales was to have one district general hospital and one acute emergency department per district. The aim that each accident and emergency department should have one or more consultants has never been realized. This system was supposed to provide uniformly good emergency care, but it is now criticized. Furthermore, there are suggestions that many of the accident and emergency departments in London should be closed and that the functions of two or three in a group could be centralized.

What is being done at this moment to improve trauma services? The Department of Health has accepted the criticism that improvement should occur but has neither agreed nor planned 25 trauma centres. Instead, it has commenced an evaluation of the four trauma centres at Stoke-on-Trent, Hull, Preston and the Royal London Hospital. Professor Brian Williams, director of the Medical Care Research Unit at Sheffield, was chosen to research these four systems so that the government could make logical decisions. The two main projects are, first, an evaluation of regional trauma care systems comparing Stoke with the 'normal' district general hospitals at Hull and Preston, and, second, an evaluation of the Royal London Hospital's enhanced Helicopter Emergency Medical Service<sup>4</sup>. The research group is interested in prehospital care, so there is a further arm of the London study which will assess the effect of land ambulances staffed by personnel with enhanced training (paramedics). The same team is undertaking another study of the West Country helicopter service in Cornwall and the Sussex Police Helicopter Emergency Service. Both of these differ from the Royal London Hospital helicopter service in that they do not have suitably trained doctors on board.

Endpoints of the evaluation are in terms of mortality and morbidity. Major Trauma Outcome Study-type information will be collected. Morbidity will be recorded using global instruments of disability and correlated with the original trauma severity, measured by the North American Anatomical Injury Severity Score, and the physiological response, using the Revised Trauma Score.

Costs will be assessed for all the hospital and transport systems. 'Marginal' costs of cases brought in by helicopter will be calculated adding the costs of this transport

system to those that would normally occur if the patient came to hospital by land ambulance. Cost-benefit will be calculated by matching costs and marginal costs with the benefit of improved care, taking into account death and the expense of disability to the individual, his or her family and society. The mathematics are daunting because the cost of the premature death of a young person from a road traffic accident is now calculated by the Department of Transport at about £700 000; this includes such items as widow's pension, child allowance, loss of earnings, loss of production and loss of tax paid to central government (the Department of Health does not accept this figure). A further assessment will be made of which particular factors are most important in each of the different trauma care systems under evaluation.

Evaluation of the Greater London system, which is the only fully integrated helicopter emergency medical system with a doctor and paramedics on board, will be completed early in 1994. The study of the Sussex and Cornwall air ambulances, which are not directed specifically at trauma, will be completed later. The Stoke, Hull and Preston evaluation was started only in 1992 and will not be ready until 1994-1995. It should be understood that these three centres are not typical district general hospitals because all three have in-house neurosurgery units. Another difference is that Stoke has a team of six consultants who provide continuous 24-h cover for the 168-h week. If results vary between different systems, details must be examined to include prehospital transport, on-scene treatment and call-out systems.

The following statements are offered as a basis for discussion before decisions are made about building the suggested 25 trauma centres. The Department of Health evaluations will be ready in 1994-1995 and should provide the data needed for informed decision making.

1. Trauma care should include prevention, treatment and rehabilitation.
2. Treatment includes prehospital care, with rapid transport by land ambulance or helicopter and highly trained ambulance personnel with or without doctors, and care in a hospital that has all the local acute district general hospital services and immediate access to essential regional specialties by fast secondary transport.
3. Prehospital treatment saves lives by avoiding death from respiratory or circulatory causes. This must be improved and the paramedics integrated into the hospital services.
4. Hospital care may result in death from an avoidable cause. Early surgery and adequate intensive therapy are essential. Consultant-led teams experienced in multiple trauma should be encouraged.
5. Since the majority of hospital deaths result from head injuries, a neurosurgical unit should be associated with every trauma centre. The corollary is that no neurosurgery unit should exist in isolation from an acute general hospital.
6. All neurosurgical and other specialist units (burns, maxillofacial, cardiothoracic, transplantation) should have helipads to facilitate secondary transport. Ideally they should be integrated into acute hospitals.
7. Closure of some hospitals, and accident and emergency departments may eventually lead to others taking on the form of a trauma centre, with the essential specialty mix. This does not imply a UK network of expensive new trauma centre hospitals.
8. The ideal system of trauma care has not yet been agreed but any improved system should exist on a national scale, be available to the whole population and be paid for by the National Health Service.

**R. Earlam**

*The Royal London Hospital*  
*Whitechapel*  
*London E1 1BB*  
*UK*

1. Commission on the Provision of Surgical Services. *Report of the Working Party on the Management of Patients with Major Injuries*. London: Royal College of Surgeons of England, 1988.
2. *The Health of the Nation. Key Area Handbook: Accidents*. London: Department of Health, 1993.
3. Anderson ID, Woodford M, De Dombal T, Irving M. A retrospective study of 1000 deaths from injury in England and Wales. *BMJ* 1988; **296**: 1305-8.
4. Kirk CJC, Earlam RJ, Wilson AW, Watkins ES. Helicopter Emergency Medical Service operating from the Royal London Hospital: the first year. *Br J Surg* 1993; **80**: 218-21.